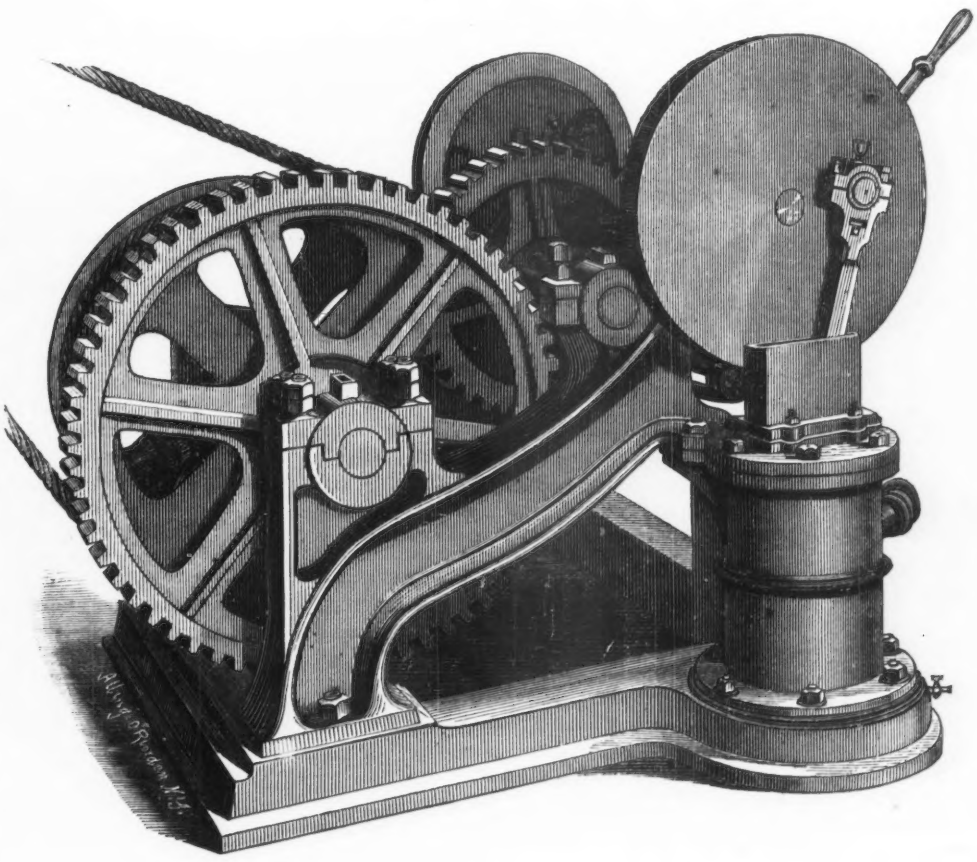
THE ENGINEERING AND MINING JOURNAL.

VOL. XIII.—No. 23.—FOURTH SERIES.] NEW YORK, TUESDAY, JUNE 4, 1872. PRICE 10 CENTS PER COPY.

Bacon's Double Geared Hoisting Engine.

WE illustrate this week a motive power designed for the special work of hoisting stock for blast furnaces. Hydraulic and, especially, pneumatic lifts seem to be finding increasing favor in Europe, but in this country we believe the rope lift is preferred. The Bacon Engine will work two platforms and can be managed by a man at the top. As its title indicates it is double geared, and has, therefore, a steady and constant motion. It has the link motion for reversing. These machines are strongly made, with a large drum to adapt them to the use of wire rope, and are all carefully tried at the works, and shipped in complete working order. The Morris County Machine and Iron Company, 36 Cortlandt street, New York, are the manufacturers.



BACON'S DOUBLE-GEARED HOISTING ENGINE.

American Institute of Mining Engineers.

Report of the Annual Meeting, 1872.

Continued from page 340.

EVENING SESSION, May 21st.

THE President then read the following report of the Council.

The Council respectfully report that the American Institute of Mining Engineers has held four meetings at Wilkesbarre, Bethlehem, Troy and Philadelphia respectively, all of which have been well attended and socially and professionally most successful. The proceedings of these meetings, having been published in the ENGINEERING AND MINING JOURNAL, and sent to all Members and Associates, are sufficiently well known, (the titles of forty-four papers, by twenty-six authors, were read, showing the wide range and the practical character of the proceedings of the Institute.)

The finances are in a satisfactory condition. By the report of the Treasurer it appears that $1,290 10 have been received, $519 90 expended, and that $770 20 now remains in the treasury, exclusive of fees for 1872. This fund, it is hoped, will be so increased by voluntary subscriptions as to enable us, before long, to issue a volume of our more important transactions in permanent form.

The Council has made a favorable arrangement with the Scientific Publishing Company publishing the ENGINEERING AND MINING JOURNAL, by which that journal became the organ of the Institute for the first publication of all proceedings, papers, and notices to members. This arrangement it is proposed to continue through the present year unless the Institute shall otherwise direct. It is not intended to supersede the publication of an annual or occasional volume, but to maintain an interest in the Institute, and to serve the convenience of members while our funds do not permit a more ambitious publication.

One member has made himself a life member, an example which the Council hopes will be imitated by others.

A large number of persons, 201 in all, have been duly recommended, approved and elected Members and Associates; but no person has been so elected except when voluntarily offering his own name as a candidate, or when it was offered by his friends in his behalf. The Institute has begged nobody to join its ranks, and the Council begs leave to make this general reply to rumors which have reached it of the surprise which many worthy and eminent engineers and metallurgists are said to have felt because they were not elected to membership. In many cases the names sent to the Secretary as candidates have been accompanied by insufficient addresses; and this has led to considerable trouble, many elected Members and Associates not receiving papers and notices duly mailed to them. A considerable number have from this cause failed to pay their dues, or to attend the meetings, and the Council presents a resolution to suit this case. For the future it is hoped that members, by seeing to it personally that their exact address is in the hands of the Secretary, will avoid the recurrence of such annoyance.

The report was adopted, and the President offered the following resolutions by direction of the Council; they were all adopted.

Resolved, That all persons elected Members or Associates at the Philadelphia meeting, or who, having been elected at any time, have failed to receive due notice of their election, shall be considered as elected from this date, and shall pay in dues ten dollars only, until May, 1873.

Amendment to the rules:

To amend Rule IX. to read:

General meetings of the Institute shall be held on the third Tuesday of February, May and October, and the May meeting shall be considered the annual meeting.

Resolved, That the Council be and is hereby authorized to make all necessary or advisable changes in the classification from Associates to Members or *vice versa*.

The PRESIDENT read a letter from the late President, DAVID THOMAS, thanking the Institute for its action in regard to him, at its Philadelphia meeting.

Twenty-nine new members were then elected. Excursions were announced to the Stevens Institute, Hoboken, the blasting operations at Hell Gate, the caisson of the Brooklyn Bridge, the School of Mines, Cooper Union, the Chrome Steel Works, and other manufactories. An invitation to a reception at the house of Mr. HEWITT was also presented.

Prof. PEIRCE read a paper on Researches upon

the Consumption of Heat in Blast Furnaces, which we shall soon publish.

Mr. EILERS read a paper on the Metallurgical Value of the Lignites of the Far West.

This paper called out a good deal of discussion, the general impression being that since the coals of the West are not cokeable, they will have to be utilized in gas generators.

Mr. PECHIN said that the Johnstown Iron Company some years ago tried to make coke in bee-hive ovens, from a four-foot vein of coal. But the coal was friable, the amount of pyrites and slate enormous, and the result was that the coal was not even heated through. By washing their coal and using Belgian coke ovens they made coke of excellent quality, and have now put up washing works. He asked if similar operations would not succeed in the West.

Mr. CHURCH thought they would with the coal from particular regions. In the West almost all varieties of coal are found, arising from the metamorphism of coal beds.

Mr. BRITTON had seen in Mississippi a coal which was friable, contained 12 per cent of water, and gave 12 to 14 per cent. of oleaginous matter. It was dark brown when mined, but grew lighter in the air, and could be set on fire by the embers of a cigar or pipe. It could be mined cheaply, and coal oil might be made from it.

The PRESIDENT thought that from the description, this coal was quite different from the lignites of the West. He had seen coke made in Utah and Wyoming; it was not good, lacking the lustre and a certain degree of firmness.

Mr. ROTHWELL asked for statistics of coal washing.

Mr. PECHIN replied that the cost of a machine for working many tons daily was about $3,000, and that the operation being altogether mechanical must be very cheap. The coke from washed coal, though not equal to the best Connellsville coke, was very good indeed. The Belgian coke ovens were 2½ feet wide, 5 feet high, and 20 feet long.

Prof. BLAKE thought the Belgian oven would succeed, and observing that pressure as well as heat entered into the process of metamorphizing coal, asked if pressure did not have something to do with coke-making.

A discussion arising on Rhode Island coal,

Prof. BLAKE said he had used it in the N. J. Zinc Works for mixing with the ore, but it was a failure.

Mr. NEWTON said it is now used in various manufacturing works in Providence, and the mines are giving some coal.

Mr. DADDOW thought that there is no true coal west of Omaha, but there being coal at Fort Dodge, Iowa, of exceptionally good quality, he was of opinion that the Eastern beds come up to the surface there.

Mr. PECHIN did not think the Fort Dodge vein true coal. When he saw it, there was a three-foot vein opened, above it another seven-foot vein, and above that a two and a half-foot vein of cannel had been discovered. The coal seemed to be semi-bituminous and spotted with lignite.

Mr. DADDOW repeated his opinion that the Fort Dodge field was an outlying basin of true coal.

The PRESIDENT said that though the geological horizons which we have East may continue West, it is not necessarily a consequence that the coal beds do also. There is nothing which should lead us to suppose that because the Eastern strata dip toward the West, we shall find them coming up again in any place. In reference to Western coals, we cannot talk about the sintering, or fusion of carbon. It has never been done even by the greatest effort. Nevertheless, coke has an appearance which indicates that the coal has been softened or melted. It is not merely the skeleton of the coal, but a skeleton *plus* sintering. There is good ground for believing that high temperature is important, more important than high pressure in coking light coals. In the West there is a great variety of coal, semi-anthracite in New Mexico, and good coal in Southern Utah. When we consider the cost of bringing charcoal 500 miles, and carting it 10 or 12 miles, added to the first cost of 25 cents for 15-20, pounds, we see how important the utilization of Western coal is.

MORNING SESSION, WEDNESDAY, MAY 22.

Mr. ALEXANDER read a paper on Indiana Block Coal and Rival Fuels; this paper will soon be published in full.

Mr. ALEXANDER stated, in response to inquiries, that mining on these coal veins had not yet been reduced to a system, but is still rather roughly done. Most of the miners have been brought from Youngstown, Ohio, and the system is the same as that pursued there. Shafts are not sunk, the veins being opened in those situations which permit drifting. It is pillar and chamber work with subsequent removal of pillars. The chambers are 12 feet wide, and the pillars 12 feet thick. The roof is weak and apt to fall. The veins are nearly level, having but a slight dip which is S.W. The coal deteriorates by standing in pillars. Each foot in thickness gives 1,000 tons to the acre, or 4,000 tons an acre for the main seam. In Brazil County the lessees pay 28 cents for the main seam, and 15 cents for a lower one. In one case the lower seam was found the best. One dollar a ton is about the cost of mining, and there is 23 to 75 cents for administration. The work is done by the pick, the miners objecting to machines. There are two veins separated about 30 feet, one 4 feet and the other 3½ feet thick.

The PRESIDENT enquired about the leases.

Mr. ALEXANDER replied that the leases are mostly for long time, and the royalty covers only the coal sent to market.

The PRESIDENT, in continuation, said that this reminded him of many of the Pennsylvania leases, made on similar terms, and open to the serious objection that the lessee had no incentive to good mining. However wasteful he might be, it was the owner of the land and not the worker who suffered. Leases should be so drawn that the lessee would bear his proportion, at least, of losses by bad working.

Mr. PECHIN said that Pittsburg heard a great deal about its "rivals." Every now and then something came up that was sure to undermine the prosperity of Pittsburg. But, in his opinion, while they could mine Connellsville coal for 28 cents a ton, and coke it for 50 cents more, he felt that he could go to sleep very comfortably on that bed and let rivals who had to pay $1 a ton for mining do their worst. Their coke cost less than Indiana coal, and contained only 8 to 12 hundredths of a per cent. of sulphur.

Mr. ROTHWELL said that in West Va. the men made 15 per cent. better wages working long wall, and the company also gets its coal cheaper. He thought that was the system for the Block coals. Other members expressed the same opinion.

MR. ALEXANDER said that the sulphur exists in the form of small flakes of pyrites sometimes very difficult to find.

Mr. ROTHWELL read the following Analyses of the Alabama coals:

	1	2	3	4	5
S	0·50	0·95	0·52	0·86	1·4
Fixed C	66·22	62·62	63·04	63·68	64·54
Ash.....	4·62	3.20	2·02	2·20	2·47
	6	7	8	9	10
S.....	0·43	0·63	3·00	0·56	0·52
Fixed C	64·91	62·20	59·64	66·53	66·81
Ash	1·53	2·28	5·59	1·09	1·21

The water varies from 1·4 to 2·13 per cent; and the specific gravity averages 1·12. These coals are from the Southern portion of the Cahawba field.

Mr. BRITTON spoke of the necessity of taking innumerable samples in analyzing coals in order to obtain average results. He thought our published analyses at fault for commercial use, in having been made upon small pieces.

Dr. HUNT said that in analyzing Nova Scotia coals he had been in the habit of crushing a great quantity and averaging this sample. He found a very decided difference between such analyses, and those made upon hand specimens. The method suggested by Dr. STORER, of Boston, gives satisfactory results; in this the oxidation is caused by potassium chloride and nitric acid. The sulphates of alumina, iron and magnesia, are just as prejudicial as pyrites, because they are reduced in the furnace to sulphides; but the calcic sulphate passes unchanged into the slag.

The PRESIDENT said that manganese probably tended to preserve the sulphates from reduction.

Dr. HUNT thought that manganese was not necessary with calcic sulphate, unless, possibly, with a very acid slag. With a slag properly basic there is no danger of reduction.

The PRESIDENT said that anthracite and the Alabama coals are not the real rivals of the Block coal, because of their geographical position. The Indiana coal is geographically opposed to coals which it is very easy to surpass, but were the conditions of transport altered, its superiority might not be unchallenged.

Mr. ALEXANDER said that he was indebted for the expression "rival coals" to Captain Ward, of Detroit, who told him that he had found the Block coal superior to any of its rivals. The Indiana coal makes excellent Bessemer steel iron, which he believed had never been attempted with Connellsville coke.

The PRESIDENT pointed out that any good fuel would make Bessemer pig, provided the ore was right. The Pittsburg men certainly had a fair chance of holding their own so long as they could make iron with a ton and a quarter of coke, while three tons of Indiana coal were required, and each ton cost more than the Connellsville coke.

Mr. MAYNARD said that Grand Tower pig had been used in the Troy Bessemer works, and 35 to 40 per cent. gave excellent results. It came by New Orleans, and was cheaper than the English iron. The phosphorus amounted to 0.068 per cent. The iron made at St. Louis from the same ores and coal had the same amount of phosphorus.

Mr. FIRMSTONE said that anthracite was used in making Bessemer pig from Cornwall ores.

In reply to a question by the President, Mr. MAYNARD said that Ringwood iron, containing 4½ and 5 per cent. of silicon, was used with very white iron.

Mr. BRITTON said that the Cornwall ores have 3-4 per cent. of sulphur, but that is eliminated by roasting.

Mr. MAYNARD thought that sulphur is no great bugbear. Four to five per cent. are easily roasted out in Sweden, and we have one similar furnaces in America. The Cornwall iron is used at Johnstown.

Mr. COXE thought that new analyses of the anthracites are necessary to determine whether they have phosphorus. Our analyses are all old; and were made by old methods of analysis, and before the questions of the present day had acquired their importance.

Dr. HUNT. There is probably no phosphorus in anthracite or bituminous coals, because there is nothing to retain the phosphorus. The white ash coals have had their iron eliminated by solution, and as iron phosphide is very soluble, these coals at least bid fair to be free from this impurity.

Mr. BRITTON said that phosphorus had been found in the ashes of Ohio coals.

The PRESIDENT announced that the Council, having received the proper recommendation, signed by ten members, unanimously present Mr. I. Lowthian Bell, of England, distinguished for valuable services in scientific iron metallurgy, to be made an honorary member of the Institute. Mr. BELL was then elected by a unanimous ballot.

Mr. BRITTON read a paper on a mode of determining carbon in steel by solution in nitric acid, and comparing the solution with a standard scale. This paper we shall hereafter publish in full. The author dissolved three portions of steel, and the solutions

being submitted to two gentlemen of the audience, were found to mark 16, which agreed exactly with the amount of steel previously ascertained by other modes of analysis.

Mr. CRAFTS asked if there had been any determination of the carbon in the gray spots in mottled iron, apart from the white spots.

Mr. BRITTON had found less graphitic carbon in the white than in the dark spots.

Mr. CRAFTS asked for an explanation of the phenomena of chilling in iron; and mentioned instances of unaccountable differences in chills.

Mr. FIRMSTONE said that at the Glendon works where they made anthracite iron, they tried to make car wheels from their own iron, but found the greatest differences of chill in the same wheel. By mixing in one-third charcoal iron they now obtained a regular chill.

Mr. BRITTON once made analyses to ascertain the difference of quality in rails of the Baltimore and Ohio railroad. Some had been down thirty-three years, others had broken up almost as soon as laid. He examined for phosphorus, sulphur and carbon, but could find no regular differences. The discrepancies were too great to form a theory. The old rails had been made from one bloom; the later were piled rails. He has examined Milwaukee ore, which contained 4 per cent. phosphorus to 100 of iron, or about 1¾ per cent. of the ore.

Dr. HUNT described an old Walloon fire at Three Rivers, Canada. It is worked by the descendants of the Walloons who built it. They make a pig containing 1-2 per cent. phosphorus, the bar having ¾ to 3-10 of one per cent. It has a great reputation in that region for sleigh runners, hoes, spades, &c.

Dr. HUNT then described a new method for the extraction of Bismuth, and gave some practical results of the Hunt & Douglas copper process. We shall publish his remarks *in extenso* hereafter.

AFTERNOON SESSION, May 22.

A paper was read by MR. CHURCH. Subject: "Economical Results in the Treatment of Gold and Silver Ores by Fusion."

The PRESIDENT thought that the difficulty in establishing such works in Colorado would be the want of a sufficient supply of lead ores, the Georgetown ores consisting in great part of argentiferous blende; and cited the experience of the works now in operation in that Territory. He inquired what the difference was between this process and that of Professor HILL.

MR. EILERS asked if the ores at Lend did not contain a larger proportion of useful mineral than those of Colorado?

MR. MAYNARD thought that the prospects of such a treatment as that proposed were good.

MR. CHURCH, in reply, said that nearly all the gold ores of Colorado contained enough lead to supply the waste of the process. A certain stock of lead or lead ores would have to be supplied in the beginning, and the lead in the ores treated would then supply or nearly supply the waste. The Lend ores did not contain more than 2 per cent. of galena, while the Colorado ores often have 4 and 5 per cent. The product of the lead mines is small, but it is probably enough to supply such works as those proposed. The difference between the Lend method and that of Professor HILL is, that the former is a shaft-furnace process, and the latter uses a reverberatory. In the shaft the lead is more thoroughly reduced and saved, while the oxidizing action of the reverberatory tends to slag the lead. Professor HILL, however, concentrates his ores to a copper and lead matte, and produces no gold or silver. The proportion of useful mineral is larger in the ores of Colorado than of Lend; otherwise the Lend ore is almost the counterpart of those in Colorado, consisting of sulphide of iron, copper, lead and zinc, with a gangue partly silicious and partly basic, and it was this similarity of ore that attracted his attention to the operations at Lend.

Professor BLAKE exhibited sections of the floors in the Emma mine in Litttle Cottonwood, Utah. These floors are 7 feet 3 inches apart, and a comparison of the sections shows that the mass has a more or less lenticular form, a dip of 42 deg. to 45 deg., and a general N. E. and S. W. strike. The variations in form are quite marked.

The PRESIDENT asked whether the four floors which the diagrams exhibited as unworked was all the working reserve of the mine.

Prof. SILLIMAN stated in substance, that it gave him pleasure to say that since August, 1871, when the plans of the great chamber of the Emma mine now exhibited to the meeting by Prof. BLAKE were prepared, great progress has been made in the work of exploration of the mine beyond the limits of the ground then known. These explorations have revealed the fact that the footwall of the ore mass is continuous both in depth and extent so far as they have been pursued. Thus in depth, two winzes have been sunk in ore, one near the old whim shaft to a depth of about 100 feet below the lowest of the old works, and another about 125 feet northwest of the first and quite beyond the former known limits of ore, which on the 1st of April was over 130 feet below the adit, and all the way in excellent ore. Both these have followed a well defined foot wall, marked by evidences of motion, and not without a distinct selvage under the ore. In the second named, driving south east on the level of the 16th floor below the adit, the ore was found of equal value to the best average of the mine, the end yielding silver $1,995, and about 30 per cent. of lead, while the sample gave $480 and $500 to the ton. A cargo sample from these deepest explorations gave an average of $219 in silver and about 30 per cent. in lead.

On the 8th floor below the adit, the level ran in comparatively barren ground for about 50 feet on the foot wall, beyond the limits of the old chamber, when it came into good ore again, which has continued in a general northwest direction for 140 feet, which was its limit on the 1st of April. On the seventh floor above the adit, following the same foot wall without ore for about 20 feet, good ore came in and has continued for over 200 feet, or in all up to April 1st, 228 feet beyond the old body. Thus it appears that beyond the limits of the original great chamber the ore in the Emma mine is proved, by explorations prior to April 1st, to have a depth on the foot wall of over 250 feet and a longitudinal extent of over 200 feet. These new explorations have gone far toward furnishing the daily demands for shipment of ores, without entrenching materially upon the old reserve, and without stoping out in the new ground. The volume of the new ore bodies there exposed has not been fully determined. But from the portions actually opened out in the drifts and winzes it is believed to be quite safe to estimate the new ore bodies as holding over two years of reserves, and probably much more. The eastern limits of the ore have not been as yet well declared, the policy of the management being to employ the force of the mine almost exclusively in opening up new ground, wherever the ore may lead them, leaving it standing, for the most part, beyond the actual limit of winzes and drifts, and the demands of the day. The shipments of ore have been restricted under the present organization to about thirty or forty tons a day, which is quite enough to pay the dividends beyond the expenses.

Professor SILLIMAN said, with reference to the nature of the deposit in the Emma mine, that he was prepared to express his firm conviction that this mine is situated upon a great mineral belt, or ore channel fully mineralized, and giving the strongest evidence, in its brecciated character, in angular and laminated fragments of the country rock torn off and pasted into the ore mass; in the continuous foot wall, striated by mechanical motion, and faced by a well found fluccan; and in the extensive alteration and decomposition of the associated minerals, that it will prevail to a great depth and extent. He did not wish to be understood as affirming that this remarkable ore mass fills a fissure formed by a fracture of the country rocks across their line of bedding. So far as can now be seen, the foot wall of the mine, which has been exposed on its slope for over two hundred and fifty feet in depth, is conformable to the lime stone beds of the mountain dipping at an angle of 45 degrees into the hill. The hanging wall has as yet been seldom seen in the new explorations, but is distinctly visible over the whim shaft, in the old workings, forming the eastern margin of the great ore body first opened.

While the gangue of this ore body rarely shows any crystalline quartz, the analysis of a cargo sample of the ores shows that there is over forty per cent (40 per ct.) of silica diffused in the mass in the form of an impalpable powder. This fact explains the refractory nature of the Emma ores in the furnace. Professor S. had thought at first this silica might have been derived from the limestone which is often friable and granular, and seemingly silicious. This fine granular rock however proved on analysis to be nearly free from silica, and a true dolomite. He was, therefore, led to believe that the silica was an original and integral factor of the ore mass, and that we might yet expect to find crystalline quartz in the vein upon further exploration. The almost total absence of iron sulphate was alluded to, and the absence of pyromorphite, and the occurrence of wulfenite in small quantity. These and other facts relative to the mineralogical character of the Emma mine, and the paragenesis of the Epigene species it contains, Professor S. had already set forth in a short paper which appeared in a former number of this journal.

In conclusion attention] was called to the small cost of working the Emma mine owing to the soft nature of its decomposed ores. Only 14 miners were employed at the mine in all descriptions of mining, and the average cost of extracting the ore and placing it in the ore house had not exceeded 8 per ct. of its gross value, all expenses included.

It was probable that all the ore containing not over 30 per ct. of lead would soon be worked by milling process, at the mine, thus effecting a very important saving over the present system of shipment to England for smelting, which involves an aggregate cost, all told, of nearly one hundred dollars per ton.

Active explorations are continued, and we may reasonably expect that new developments will shed further light upon this interesting and most productive mine.

A lively discussion then arose on the subject of the rocks surrounding the Emma deposit. The PRESIDENT thought that in a formation which included beds of quartzite on one side and granite on the other, it would be odd if the limestone lying between were free from silica. He had supposed it to be highly siliceous.

Professor SILLIMAN spoke of the great difficulty of determining the character of these rocks from their appearance to the eye. He did not agree with the President in thinking that the silica in the ore could have been derived from the rocks, though how it came there he could not say.

Professor BLAKE said that in his opinion when this subject became fully understood, the Emma would be found to be a contact deposit lying in the limestone near the granite.

The PRESIDENT spoke of the fallacious idea that true veins always cut across the formation. In the great mother vein of California the slates have been separated for a hundred miles not all in one seam, but apertures have opened in the successive seams, and having been filled with ore now from veins which lie *en echelon*. This peculiar formation results from a force acting obliquely to the line of bedding. In the formation of fissures the opening takes place naturally along the lines of least resistance, which in beds are the seams. A noticeable difference is observable between the geology of this country and Europe. Foreign scientific literature speaks almost entirely of fissures across the bedding, and from the absence of reference to fractures in line with the bed-

ding, he inferred that this occurred but rarely in Europe. In America the contrary is the case, our fissures mostly lie in the seams and follow the direction of the bedding.

Professor BLAKE thought this due to the greater simplicity of American geology. About Mariposa and Copperopolis the beds show evidences of having been drawn out as well as pressed and folded.

Mr. COXE read a paper, illustrated with drawings, on the new method of sinking shafts with the diamond drill, employed at St. Clair, Pa., when several members spoke of the remarkable smoothness of the walls left by firing all the holes on the sides of the shaft at once; and of the fact that though dynamite was used it did not tear back in the least.

The Scrutineers reported the following officers elected for 1872.

President.

R. W. RAYMOND.....Brooklyn, N. Y.

Vice-Presidents.

ECKLEY B. COXE.....Philadelphia, Penn.
W. R. SYMONS.....Pottsville, Penn.
W. P. BLAKE.....New Haven, Conn.
J. F. BLANDY.....Philadelphia, Penn.
R. P. ROTHWELL.....Wilkes-Barre, Penn.
THOMAS EGLESTON.....New York City.

Managers.

G. W. MAYNARD.....Troy, N. Y.
THOMAS PETHERICK.....Pottstown, Penn.
E. GAUJOT.....Pottsville, Penn.
FREDERICK PRIME, JR.....Easton, Penn.
J. P. LESLEY.....Philadelphia, Penn.
E. C. PECHIN.....Dunbar, Penn.
T. B. BROOKS.....Marquette, Mich.
T. M. DROWN.....Philadelphia, Penn.
A. S. HEWITT.....New York City.

Secretary.

MARTIN CORYELL.....Wilkes-Barre, Penn.

Treasurer.

J. PRYCE WILLIAMSON.....Wilkes-Barre, Penn.

The Scrutineers asked for instructions concerning the sentence in the Rule VIII B. which reads: "On the conclusion of the scrutiny the voting papers shall be destroyed, and the List, prepared and verified by the scrutineers, shall be kept until the next annual meeting." They desired to know if they were required to publish the names of all candidates, and the number of votes each candidate received.

The PRESIDENT said the rule was ambiguous but he judged its spirit to be as follows: In order to avoid any possible occasion for feeling among members, the scrutineers were appointed to take charge of the votes, ascertain the result and publish it. The votes themselves are not to be published, but are to be destroyed by the scrutineers. This ruling, meeting with no objection, was confirmed.

The report of the evening session of Thursday, May 23, and an account of the various discussions, will be given in our next number.

Engineering and Mechanical Notes.

SOME rather exceptional coal mining is attempted at Cape Breton. The coal beds run under the sea, and as the shafts lie about 200 yards from the shore, it was but natural that heavy bodies of water were encountered in sinking. The pits were sunk to a depth of 40 fathoms, when a strong feeder of salt water was met with, to which there was a drill hole bored, but the water came up to such an extent that the pumping-engine had to keep going night and day. The second pit was sunk down to the same feeder, but a hole was kept ahead of the sinking, and when the water was tapped a plug was put in and partly stopped it. The services of a diver were then obtained, who went down in about 20 feet of water, and effectually stopped it, so that at present they have only the top feeder to encounter, which gives about 66 gallons per minute. The shafts were started in April, 1867, just five years ago, but the water could not be mastered.

Mr. A. VERNON HARCOURT proposes to nearly eliminate sulphur from coal gas by passing it through tubes containing iron heated to redness. When dry hydrogen, contaminated with the vapor of bi-sulphide of carbon, is passed through a heated glass tube, carbon is deposited, and sulphuretted hydrogen is produced. The action is precisely the same when coal gas containing bi-sulphide of carbon is made to pass over strongly heated surfaces; the bi-sulphide is decomposed, and sulphuretted hydrogen formed, which is speedily removed by the ordinary purifying apparatus. This process, it is said, does not decrease the illuminating power of the gas, but the sulphur is reduced to one-fifth the English legal maximum, 30 grains in 100 cubic feet.

The Austrian government is building for its navy a floating steam workshop for the making and repair of iron work. It is strong enough to sustain the blows of a one-ton steam hammer, and of all the other shocks common in such a factory.

In the basin of Autun, in France, oil is distilled from bituminous schists in revolving retorts. These retorts turn upon trunnions, one of which is hollow, so as to permit the escape of the gaseous products. The rotation of the retorts has the advantage of agitating the contents, and of bringing them successively into contact with the heated sides of the retort in such a manner that the whole of the charge is equally submitted to the action of the heat. The operation of distilling includes: 1. The charging and emptying of the retorts, which lasts about forty minutes; 2. The first process of distillation, which yields weak ammoniacal liquor, and a small quantity of gas—this stage occupies about four hours; 3. The second stage of distillation, which gives as its product heavy oil, strong ammoniacal liquors, and gas in abundance. During the first stage it is necessary to force the heat, in order to drive out the water, but as soon as the oil appears no more fuel is charged upon the grate, the heat in the retorts, and that remaining in the furnace, being sufficient to complete the operation. One ton of schist should give about thirteen gallons of crude oil.

M. LOUIS LA BRECHE-VIGER, of Montreal, has obtained a patent for a method of manufacturing axes, hammers, and other implements, by first making them of wrought iron and then converting them into steel. The articles to be treated are immersed in a bath of molten cast iron free from sulphur and phosphorous, and carburized to its utmost capacity. The best for that purpose is spiegeleisen, but such cast iron may be made by melting good malleable iron or blister steel in a cupola furnace. The articles are left in this bath a space of time which must vary with the degree of hardness desired to be imparted to the metal and with the size of the articles, and also according to the intention of converting the whole mass of the metal into steel, or simply of converting the surface so as to contain a core of malleable iron.

The well known FELL central rail locomotive is to have an exceptionally severe trial in England. It will work on an incline about one mile in length, and which has two sharp curves, two chains in radius, and the gradients are made respectively 1 in 11, 1 in 12, 1 in 13, and 1 in 14.

DR. MARSDEN, of Quebec, has written a letter to General SEYMOUR, engineer of the North Shore railway of Canada, advocating the construction of a tunnel at Quebec to connect with the United States.

English sportsmen can now have their pigeon matches without birds, thanks to a novel application of the principle of the ærial top, which has lately been effected by Mr. Bussay, of the Museum of Firearms at Peckham. This is the gyro pigeon, which is a plate of thin steel cut into the shape of a pair of elongated oval discs, connected in the centre and bent at an angle like the blades of a screw propeller. It is spun from a spindle which is rapidly rotated by the action of a coiled spring enclosed in a metallic box, and released by a cord. The gyro pigeon is spun into the air and is then fired at. It is good practice for the sportsman, as its flight is rather quicker and sometimes more erratic than that of the real bird.

New Publications.

A POCKET DICTIONARY OF TECHNICAL TERMS USED IN ARTS AND MANUFACTURES. *Abridged from the Technological Dictionary of* RUMPF, MOTHES AND UNVERZAGT, *with the addition of Commercial Terms.*—Three volumes, German-English-French, English-German-French, and French-German-English. New York; L. W. Schmidt, 24 Barclay street, 1872. Price for the three volumes, unbound, $3.25.

Every engineer, technologist, scientific enquirer or practical mechanic or manufacturer, who attempts to follow the literature of his business in other languages than his own, is perpetually embarrassed by the inadequacies of ordinary dictionaries for the translation of technical terms. Such works as the one before us are indispensable to the student, who means to go deeper than the surface, and to keep pace with the progress of foreign countries. This dictionary we have found very satisfactory in contents and plan. It is printed in fine but clear and new type, and its price is surprisingly low. The volumes are small quartos in form, and about 1¼ inches each in thickness. As a "pocket-dictionary" the work would require a special pocket of double size. For handy consultation in the study it is just right.

The Commissioner of the census has issued a volume of statistics of agriculture. The following are the number of farms in the Territories and Pacific States: Arizona, 172; California, 23,724; Colorado, 1,738; Dakota, 1,720; Idaho, 414; Montana, 857; Nevada, 1,036; New Mexico, 4,480; Oregon, 7,587; Utah, 4,908; Washington, 3,127; Wyoming, 175; total, 49,928. These show how determined and substantial is the tide of emigration to the far-west. It does not depend entirely upon mining for its support; but those States and Territories that have only second rank as mining regions, take high rank as farming countries. Nevada, for instance, has few farms, compared to its population and necessities, while Oregon and Washington Territories have respectively 7 and 5 times as many farmers as Nevada. Undoubtedly differences of soil and climate have much to do with this result. But the fact remains that though Nevada, Colorado and Montana offer great temptations to the farmer as markets, their mines are after all the real attraction. Another point worthy of notice is the small size of the farms. Three acres of land and over make a farm for census purposes, and in New Mexico those of 100 acres form but one-fourteenth of the whole, while in Arizona two-thirds are of this size. But the farms in general are under 50 acres in the West.

New Patent Magnetic Lock for Safety Lamps.

AT a recent meeting of the Midland Institute of Mining Engineers, a paper was read by Mr. MILLS, of the firm of J. MILLS & Sons of Newcastle-on-Tyne, on Craig and Bidder's Patent Magnetic Lock for Safety Lamps. In describing the patent magnetic lock, which is in use at the Harecastle and Woodshulls Collieries, Staffordshire, the writer showed that all previous inventions had hitherto failed in preventing the miners, and other persons working in the collieries, from opening their lamps with forged keys and other implements. Refering to the numerous explosions which have occurred through the lamps being tampered with, the writer showed the great need for a lamp which could not be opened except by those in charge. He further explained that the lamps are self-locking by being screwed round, and they cannot be opened except by the aid of a powerful magnet, which is kept in the possession of the lamp-keeper. The invention or principle can be applied to any kind of lamps in use, at a moderate cost; the invention not entailing more than about one shilling per lamp. The weight of the magnet used is about a quarter of a hundredweight; the cost with frame being £4. 15s. 0d. The locking arrangement is very simple, and is enclosed within the lamp, which is more readily opened than those with the common lock. After some discussion the paper was ordered to be printed by the society, together with the diagrams illustrating the locking of the lamps.

THE COAL TRADE.

NEW YORK, May 31, 1872.

The Anthracite Coal Trade and the Means Proposed for Regulating the Same.

The prospects of the coal trade are more favorable then was expected, so far as the maintenance of last month's prices at the Scranton sale is concerned. By the following list it will be seen that while some varieties fell a little, others rose in about the same proportion. There was nothing like the general decline which was anticipated by nearly all dealers last week. The following are the auction sales:

	Tons.	May 29.	April 24.
Lump	10,000	$3 32½ a $3 37½	$9 47½ a ——
Steamer	12,000	3 35 a 3 40	3 45 a $3 47½
Grate	20,000	3 45 a 3 57½	3 45 a 3 50
Egg	18,000	3 50 a 3 52½	3 45 a 3 47½
Stove	45,000	3 82½ a 3 90	3 85 a 4 00
Chestnut	15,000	3 47½ a 3 62½	3 37½ a 3 40

There have been a few lockouts in Pennsylvania but not of any consequence, and the supply will not be affected sufficiently to counterbalance the general excess of product. As to the combinations about which so much has been said, they are more talked of in the small offices than in the large. This method has been brought forward for years past whenever the trade was in difficulties, but we do not know that an oversupply has ever been corrected by this means, or prices affected, unless by rumors announcing the measure which was never consummated. At present the large companies do not pretend, even by way of threat, to have such scheme in prospect, but look to improvement from other causes, though what these are to be they cannot say. They seem to be relying on the undeniable fact that prices are now below cost—a state of things which must bring its own correction in time.

The Bituminous trade is about the same as at last accounts; business is dull but not especially so for the season. The prices are $4.35 at Georgetown, $4.50 at Baltimore, and $6.50 a $6-60 at New York.

DELAWARE, LACKAWANNA, & WESTERN R. R. CO.

General Office, 26 Exchange Place, New York.

102 AUCTION SALE, May 29, 1872.

120,000 Tons.

Lump	$3 32½	to	$3 37½	Average..$3 34½
Steamer	3 35	to	3 40	" 3 36½
Grate	3 45	to	3 57½	" 3 47½
Egg	3 50	to	3 52½	" 3 52
Stove	3 82½	to	3 90	" 3 82½
Chestnut	3 47½	to	3 62½	" 3 53½

Anthracite Coal Trade for 1871 and 1872.

The following table exhibits the quantity of Anthracite Coal passing over the following routes of transportation for the week ending May 25, 1872, compared with the week ending May 27, 1871.

COMPANIES.	1871. WEEK.	1871. TOTAL.	1872. WEEK.	1872. TOTAL.
*Phila & Reading R.R†	160,102	1,279,581	124,622	2,009,809
Schuylkill Canal	32,452	138,695	23,251	227,414
Lehigh Valley R. R.	26,840	516,912	67,794	1,410 036
Lehigh & Sus. R. R.	42,940	269,815	31,805	627,911
Lehigh Canal	10,247	24,528	25,068	145,772
Scranton North	9,219	21,969	16,028	247,329
" South	21,820	30,166	38,389	848,848
Penn. Coal Co., rail	14,249	17,859	24,862	448,501
" " " canal	....	....	238	1070
Del. & Hud. Canal Co.	17,625	22,385	49,885	247,606
" East	3,400	55,962	15,363	261,587
" " West	756	13,476	8,294	135,083
" " South	2,222	39,025	6,007	137,543
Shamokin	12,010	245,752	12,938	178,559
Trevorton	....	....	....	....
Lykens Valley Coal Co.	2,263	29,817	..	2,580
Wyoming South	....	....	....	....
Wyoming North	....	....	....	....
L. N. Y. C. & R. R. Co.	3,899	38,800	12,639	261,561
Williamstown Col'y	....	17 847	....	....
Big Lick Col	2,794	45,780	....	10,591
Total	362,838	2,809,209	461,009	7,201,760
1870	....	....	362,838	2,809,209
Decrease				
Increase			98,171	4,392,491

* These figures are for the week and fiscal period commencing Nov. 30.

† Less coal transported for Co's use and Bituminous coal.

Bituminous Coal Trade, 1871 and 1872.

The following table exhibits the quantity of Bituminous Coal passing over the following routes of Transportation for the week ending May 25, 1872, compared with week ending May 27, 1871.

COMPANIES.	1871. Week.	1871. Year.	1872. Week.	1872. Year.
C. & O. Canal	19,768	210,811	18,185	174,245
B. & O. R. R.	29,409	461,623	29,443	46[illegible],611
H. & B. T. R. R.	10,418	149,655	7,927	117,295
*Harrisburg & D.	11,306	240,894	10,042	228 331
*L. V. R. R.		37.725	496	13,550
P. & N.Y.C. & R. Co.	7,170	119,615	8,413	150,730
Cumberl'd Branch Canal	6,526	63,672	5,062	56,139
" Railroad	886	29,853	469	5,467
Total	85,483	1,313,848	80,037	1,215,368
	80,037	1,215,368		
Decrease	5,446	98,480		
Increase				

Philadelphia & Reading Railroad and Branches.

COAL TONNAGE

For the Week ending Saturday, May 25, 1872.

BY RAILROAD.—ANTHRACITE.

PASSING OVER MAIN LINE AND LEB. VAL. BRANCH.

	Tons.	Cwt.
From St. Clair	32,919	02
" Port Carbon	5,105	06
" Pottsville	2,997	13
" Schuylkill Haven	22,818	09
" Pine Grove	6,854	17
" Tamaqua	14,416	10
" Harrisburg		
" Dauphin	6,127	18
Total	91,239	15

FOR SHIPMENT BY CANAL.

Passing Frackville Scales	7,697	16
" Mill Creek "	3,514	08
" Schuylkill Valley Scales	386	19
" Mt. Carbon "	896	00
" Cressona "	7,482	07
" Pine Grove "		
" Tamaqua "	1,468	13
Total	21,446	03

SHIPPED WESTWARD VIA NORTHERN CENTRAL RAILROAD.

Passing Locust Gap	1,918	17
" Shamokin	4,375	08
" Herndon	.....	
Total	6,294	05

SHIPPED WEST OR SOUTH FROM PINE GROVE.

Via Schuylkill & Susquehanna R. R.	981	08
" Lebanon & Pine Grove Branch	1,186	06
Total	2,167	14

CONSUMED ON LATERALS.

From Frackville Scales	193	02
" Mill Creek "	412	00
" Schuylkill Valley Scales	641	18
" Mt. Carbon "	353	14
" Cressona "	128	07
" Pine Grove "	216	18
" Tamaqua "	281	01
Total	2,227	00

LEHIGH AND WYOMING COAL.

Received via Allentown, E. Penn'a Br.	10	10
" " Alburtis, " "	.....	
" " Oreland, G. & N. Br.	812	07
" " Connecting R. R.	.....	
" " Willow Street R. R.	424	01
Total	1,246	18

BITUMINOUS.

From Harrisburg	10,022	03
" Connecting R. R., G. & N. Br.		
" Junction R. R.	20	00
Total	10,042	03

COAL FOR COMPANY'S USE.

Anthracite	4,021	12
Bituminous	320	13
Total	4,342	05

RECAPITULATION.

	Total for Week.	Corresp'g week last year.	Increase and Decrease.
Passing over Main Line and Leh. Val. Branch	91,239 15	114,331 10	d 23,091 15
For Shipment by Canal	21,446 03	34,618 08	d 13,172 05
Shipped Westward via Northern Central R. R.	6,294 05	7,155 09	d 861 04
Shipped West or South from Pine Grove	2,167 14	1,444 11	i 723 03
Consumed on Laterals	2,227 00	2,308 17	d 81 17
Lehigh and Wyoming Coal	1,246 18	243 13	i 1,003 05
Total Anthracite paying freig't	124,621 15	160,102 08	d 35,480 13
Bituminous	10,042 03	11,306 00	d 1,263 17
Total of all kinds paying freig't	134,663 18	171,408 08	d 36,744 10
Coal for Company's use	4,342 05	3,065 13	i 1,276 12
Total Tonnage for Week	139009 03	174,474 01	d 35,467 18
Previously this year	2221936 01	1449696 18	i 772,266 03
Total to date	2360969 04	1624170 19	i 736,798 05
SHIPPED BY CANAL.			
From Schuylkill Haven	21,876 10	34,377 00	d 12,500 10
" Port Clinton	1,375 00	1,564 00	d 189 00
Total Tonnage per Week	23,251 10	35,941 00	d 12,689 10
Previously this year	204,162 09	115,150 17	i 89,011 12
Total to date	227,413 19	151,091 17	i 76,322 02

Report of Coal Transported over Central R.R. of N. J. (Lehigh and Susq. Div.)

Week ending May 25—Compared with same time last year.

WHERE SHIPPED FROM	WEEK 1872., tons ct	WEEK 1871. tons ct.	YEAR 1872 tons cwt.	YEAR 1871. tons.cwt.
Wyoming Region	30334 05	42984 06	496947 12	272027 17
Upper Lehigh Region	4323 00		76430 19	4614 06
Beaver Meadow Region				
Hazleton Region	6634 09	35 11	50504 08	2422 05
Mahanoy Region				
Tresckow Region	2713 00	110 10	40727 08	1153 13
Mauch Chunk Region	9841 09	5790 06	161231 05	29342 14
Totals	53846 03	48920 13	825841 12	309560 15
Increase	4925 10		516280 17	
Decrease				
DISTRIBUTION.				
Forwarded East of Mch Chunk by Rail	34865 06	42939 17	627810 18	269815 04
Forwarded East of Mch Chunk by Canal	13752 14	2076 14	86870 05	10871 16
Delivered at and above Mauch Chunk	1301 08	1174 00		
	394 06	2534 06	25354 01	21564 15
L. V. R. R. at Packer'n			6458 17	7113 04
Delivered to L. & B. R. R. at Plymouth Bridge	3532 09	195 16	79347 11	195 16
Totals				
Of the above there was transported on acc'nt of L. C. & N. Co.	15339 05	6805 06	204470 16	31594 01
W.-B. C. & I. Co.	20094 17	34448 10	355607 14	232067 18
Totals	35434 02	41253 16	560078 10	263661 19
Increase			296416 11	
Decrease	5819 14			

Report of Coal Transported over Lehigh Valley Railroad

Report of coal tonnage for the week ending May 25, 1872, with totals to date, compared with same time last year.

WHERE SHIPPED FROM.	WEEK. Tons. Cwt.	TOTAL Tons. Cwt.
Total Wyoming	12,389 19	243,436 10
" Hazleton	48,987 03	958,368 03
" Upper Lehigh	43 06	1,322 09
" Beaver Meadow	18,304 10	346,691 08
" Mahanoy	10,453 04	151.883 07
" Mauch Chunk	68 06	1,637 17
Total	90,245 18	1,703,337 14
Same time last year	29,431 06	584,521 02
Increase	60,814 12	1,118,816 12
Decrease		
Forwarded East from Mauch Chunk by rail	67,793 01	1,410,036 08
Same time last year	26,839 12	516,912 00
Increase	40,953 04	893,124 08
Decrease		

DISTRIBUTED AS FOLLOWS.

Forwarded East from Mauch Chunk by rail	66,851 17	1,385,563 03
do East for use L. V. R. R.	941 04	24,473 05
Delivered at and above Mauch Chunk for use of L. V. R. R.	1,383 07	28,503 18
To P. & N. Y. R. R.	8,109 15	152,095 13
To N. C. R. R., at Mount Carmel		907 12
To D. H. & W. R. R.	380 12	12,993 01
To L. & S. R. R. at Packerton for rail	219 19	6,722 18
Delivered at M'h Chunk	5 04	967 04
Delivered on line of road above Mauch Chunk	95 01	9,663 12
To L. & S. R. R., at Penn Hav., for railroad		3,950 07
Do. for canal	6,593 19	45,974 01
To Lehigh Canal Mauch Chunk	5,507 19	28,194 09
To Catawisa Railroad	157 01	3,368 11
Total	90,245 18	1,703,337 14

Delaware and Hudson Canal Company.

The following is a statement of Coal Transported by the Delaware and Hudson Canal Co. for the week ending May, 25 1872.

	FOR THE WEEK.	FOR THE SEASON.
By Delaware and Hudson Canal,	49,685	247,606
By Railroad, East	15,363	261,587
" " West	8,294	135,083
" " South	6,004	137,543
Total Tons	79,346	781,819

For the same period last year.

	FOR THE WEEK	FOR THE SEASON.
By Delaware and Hudson Canal,	17.625	22,285
By Railroad, East,	3,400	55,962
" " West	756	13,476
" " South	2,222	39,025
Total Tons	24,003	130,748
Increase	651,071	

Delaware and Hudson Canal Company.

Coal mined and forwarded by the Delaware and Hudson Canal Company for the week ending Saturday, May 25, 1872.

	WEEK.	SEASON.
North	56 895 18	1,000 933 13
South	6,003 13	137,543 06
Total 1872	62,899 11	1,138,476 19
Corresponding time in 1871:		
North	26 845 13	28,859 08
South	2,221 15	39,025 00
Total	29,067 08	67,884 06
Increase North		
Decrease North		
Increase South		
Decrease South		
Total decrease 1872		
Total increase 1872	33,832 03	1,070,592 13

Lehigh Canal Coal Trade.

Shipped for the week ending May 24, 1872.

	Week. Tons. Cwt.	Week. Tons. Cwt.
Total from Mauch Chunk Region	7,505 14	52,539 02
" " Beaver Meadow "	5,127 13	25,494 00
" " Tresckow "	1,467 02	6,559 13
" " Mahanoy "	380 06	2,678 15
" " Hazleton "	6,593 09	45.507 14
" " Upper Lehigh "	794 00	5,306 10
" " Wyoming "	3,199 10	7,686 00
Total	25,067 14	145.771 14
Corresponding week last year	10,246 14	24,528 03
Increase	14,821 00	121,243 11
Decrease		

Delaware Lackawanna & Western Rail Road Company.

Coal transported on the Delaware, Lackawanna, & Western Railroad for the week ending Saturday, May 25th, 1872.

	WEEK. Tons. Cwt.	YEAR. Tons. Cwt.
Shipped North	16,027 19	247 329 10
Shipped South	39,389 02	848,847 11
Total	55,417 01	1,096,177 11
For the Corresponding time last Year:		
Shipped North	9,218 15	21,969 05
Shipped South	21,819 15	30,105 14
Total	31,038 10	52,074 19
Increase	24,378 11	1,044,102 02

Schuylkill Canal.

Report of coal transported over the Schuylkill Canal for the week ending Saturday, May 25, 1872.

	Tons. Cwt.
From Schuylkill Haven	21,876 10
" Port Clinton	1,375 00
Total for week	23,251 10
Previously this year	204,162 09
Total	227,413 19
To same time last year	138,695 07

Statement of Coal Transported over Cumberland and Pennsylvania Railroad

During the week ending Saturday May 25, and during the year 1872, compared with the corresponding period of 1871.

WEEK.

	To C. & O. Canal Tons. Cwt.	To B. & O. R.R. C. Tons. Cwt	Total. Tons Cwt.
1872	18,185 10	29,442 11	47,628 01
1871	19,768 03	29,408 17	49,177 00
Increase		33 14	
Decrease	1,582 13		1,548 19

YEAR.

1872	174,245 08	469,611 12	643,857 00
1871	210,811 01	461,622 11	672,433 12
Increase		7,989 01	
Decrease	36,565 13		28,576 12

Cumberland Branch R. R.

WEEK.

	To C. & O. Canal. Tons. Cwt.	To B. & O. R.R. Co. Tons Cwt.	Total. Tons. Cwt.
1872	5,061 12	468 17	5,530 09
1871	6,526 07	885,19	7,412 06
Increase			
Decrease	1,464 05	417 02	1,881 17

YEAR.

1872	55,138 15	5,466 13	61,605 08
1871	63,672 04	29,853 05	93,525 09
Increase			
Decrease	7,533 09	24,386 12	31,920 01

Northern Central Railway, Shamokin Division.

Below is the return of Coal sent over the Shamokin Division of the N. C. R. W., for the week ending May 25, 1872.

	Tons. Cwt.
East	1,492 11
West	11,445 05
	12,937 16
Same time last year	12,010 13
Increase	927 03
Decrease	
Total amount shipped to date	178,558 18
Same time last year	245,751 13
Increase	
Decrease	67,192 15

Penn. and N. Y. R. R.—Coxton, Pa.

Coal tonnage for week ending May 25, 1872.

	Week. Tons. Cwt.	Total. Tons. Cwt.
Anthracite received:		
From Lehigh Valley R. R.	8,109 15	152,085 13
" Lack. & B. R.R.	1,261 15	37,199 05
" Pleasant Valley R. R.	2,222 14	45,430 04
" Sul. & Erie R. R.	1,014 12	26,845 10
Total	12,608 16	261,560 12
Distributed:		
To Lehigh Valley R. R.	1,529 10	23,950 01
To Lack. & B. R. R.		1,017 17
To S. Central R. R.	1,593 03	49,214 05
To Ithaca & A. R. R.	506 14	53 338 06
To Erie R. W. Pockets for shipm't	7,670 00	91,476 01
To individuals on line of road	86 17	11,977 07
To points at & above Coxton for use of Co.	426 04	11,779 14
To points between Waverley and Elmira	796 08	18,747 01
Total	12,608 16	261,560 12
Bituminous received from BARCLAY R. R.		
Shipped north from Towanda	8,399 09	149,580 01
Shipped south from Towanda	13 05	1,059 01
Northern Central R. R.		91 01
Total	8,412 14	150,730 03
Distributed:		
To Erie Railway	7,404 02	132 998 18
To So. Central R. R.	995 07	16,429 08
To Ithaca Valley R. R.	13 05	21 15
To individuals on line of Railroad.		834 16
To points on line of road for use of Company		139 06
Total	8,412 14	150,730 03
Grand totals transported:		
Anthracite	12,608 16	261,560 12
Bituminous	8,412 14	150,730 03
Total	21,021 10	412,290 15

Lehigh Coal and Navigation Company,

Report of Coal transported over the Lehigh Canal and L. & S. Div. of Central Railroad of New Jersey for the week ending May 25, 1872, and for the year 1872.

	WEEK.	YEAR.
Forwarded East of M'ch Chunk by Rail	34,865 06	627,810 18
Delivered at and above do.,	1,301 08	25,354 01
Forwarded East of do., by Canal	25,067 14	145,771 14
	61,234 08	798,936 13
Corresponding period last year—		
Forwarded East of M. Chunk by Rail	42,939 17	269,815 04
Delivered at and above do.,	1,174 00	21,564 15
Forwarded East of do., by Canal	10,246 14	24,528 03
	54,360 11	315,908 02
Increase on Railroad		361,785 00
Decrease " "	7,947 03	
Increase on Canal	14,821 00	121,243 11
Decrease " "		

Of the above there was transported on account of—

Lehigh Coal Nav. Co.	22,844 19	257,009 18
Wilkesbarre Coal & Iron Co.	20,094 17	355,607 14
	42,939 16	612,617 12
Corresponding period last year—		
Lehigh Coal & Nav. Co	16,644 04	45,733 00
Wilkesbarre Coal & Iron Co.	34,448 10	232,067 18
	51,092 14	277,800 18
Increase		334,816 14
Decrease	8,152 18	

Pennsylvania Coal Company.

Shipments of Pittston Coal for the week ending May 25, 1872.

	1872. WEEK.	1872. YEAR.	1871. WEEK.	1871. YEAR.
By Railway	24,862 09	448,501 19	14,248 11	17,859 05
" Canal	238 02	1,070 06		
Total	25,100 11	449,571 16	14,248 11	17,859 05
Increase 1872	431,712 11			

Prices of Coal by the Cargo.

(CORRECTED WEEKLY.)

	AT NEW YORK, June 1. R. A.	W. A.	AT PHILADELPHIA, June 1. R. A.	W. A.
SCHUYLKILL.				
Lump	$- —	$- —	- —	
Steamer	- —	- —	- —	- —
Broken	- —	- —	- —	
Egg	5 25	4 75	- —	- —
Stove	5 50	5 00	- —	- —
Chestnut	4 25	—	- —	
Pea	- —	- —	- —	- —
LEHIGH.				
Lump, (along side)	5 00	—	- —	- —
Broken	4 75	—	- —	- —
Egg	4 50	—	- —	- —
Stove	5 25	- —	- —	- —
Chestnut	4 25	- —	- —	- —
Pea	- —	- —	- —	- —
SPECIAL COALS.*				
Honey Brook, Le'h W. A.	4 00@4 75		- —	- —
Spring Mountain " "	- —@- —		- —	- —
Sugar Creek " "	- —@- —		- —	- —
Sugar Loaf " "	- —@- —		- —	- —
Old Compy's " "	4 00@4 75		- —	- —
Room Run " "	4 00@4 75		- —	- —
McNeal " "		- —	- —	- —
Girardville " "		- —	- —	- —
Hill & Harris " "		- —	3 10@4 00	- —
Shamokin " "		- —	- —	- —
Lykens Valley " "		- —	- —	- —
Broad Top " "		- —	- —	- —
McMichael " "		- —	3 25@4 25	- —
Henry Clay " "		- —	- —	- —
Powelton " "		- —	- —	- —

Dealers in these coals may be found in our advertising columns.

Company Coals.

June, 1872.

	L.	Stv.	Gra.	Eg.	Sto	Chest
*Scranton at E. Port	3 47	3 53	3 60	3 63	4 09	3 58
*Pittston at Newburg	3 90	3 90	4 00	4 10	4 25	4 00
*Lackawana at Weehawken	3 75	3 75	3 85	3 85	4 25	3 75
Wilk'b're at Hoboken	3 75	3 75	3 85	3 85	4 35	3 90
Old Co. Lehigh at Pt John'n	5 15	—	4 35	4 35	4 60	4 60
Lehigh at Eliz. Port	5 00	—	4 25	4 25	4 50	4 00

For freights to different points see "Freights."

* To contractors only.

Prices at Baltimore—June, 1872.

Wholesale Prices to Trade.

Wilksbarre, by cargo or car load	$4 60@4 85
Pittston and Plymouth, do	4 60
Shamokin Red or White Ash, do	4 75
Lykens Valley Red Ash, do	5 50
Zerba Valley	
Treverton	
By retail, all kinds per ton of 2,240 lbs	6 50@7 50
George's Creek and Cumberland f. o. b. at Locust Point for cargoes	4 60@4 65
Fairmont and Clarksburg gas f. o. b. at L. Point	6 00
BITUMINOUS COALS.	
Kittaning Coal Co.'s Phœnix Vein, f. o. b. at Phila	$
Lemon " " "	
Cumberland Vein Coal	
Consolidation Coal Co.'s on board N. Y.	
Maryland Coal Co "	

Prices at Georgetown, D.C., and Alexandria, Va.

June, 1872.

George's Creek and Cumberland f. o. b. for shipping $ 4 75

Prices at Havre de Grace, Md.

June, 1872.

Wilkesbarre and other White Ash for Cargoes	$4 25@4 50
Lykens Valley	@5 50
Shamokin Red or White Ash	4 25@4 50

Bituminous Coals (Cumberland),

Georgetown, F.o.b.	$4.25
Baltimore	4.70
New York	6.75

Prices of Gas Coals.

June, 1872.

PROVINCIAL.

Corrected weekly by Louis J. Belloni, Jr., 41-43 Pine st., N. Y.

Duty, $1 25, gold

	Coarse	Slack.
Block House	$1 60	$- 75
Gowrie	1 60	— 75

Vessels are being chartered at $3 00 to $3 25.

Corrected by Bird, Perkins & Job, 27 South street.

	Coarse.	Culm of Coal.
Pictou	$2 25	1 25
Sydney	2 25	- 80
Lingan	1 60	- 80
Little Glace Bay	1 60	1 00
Caledonia	1 60	- 80

A discount from the prices of the coarse Coal on purchase of 5000 tons and upwards. Duty $1 25 per ton, gold, on the coarse coal 25 per cent. ad valorem on the Culm of Coal

AMERICAN.

	Currency.
Westmoreland	$7 10 @- —
Fairmount Gas Coal Co. of N. Y.	7 00 @- —
Despard Coal Co	7 00 @- —
Penn	7 10 @- —
Newburg Orrel Gas	- — @- —
West Fairmount Gas Coal	7 00 @- —
AT PHILADELPHIA.	
Westmoreland	6 00 @- —

Foreign and Provincial Freights.

May 1872.

Foreign.

Newcastle and Ports on Tyne, per keel of 21 1-5 tons £

Liverpool, 5 per cent primage

TO NEW YORK.

Provincial.

Sidney	$3 00
Lingan	3 00
Cow Bay	3 25
Port Caledonia	3 25
Little Glace Bay	3 25
TO BOSTON.	
Sydney	2 90
Lingan	2 90
Cow Bay	3 00
Port Caledonia	2 90
Little Glace Bay	2 90

Prices of Foreign Coals.

June, 1872.

Duty $1 25 per ton.

Corrected weekly by PARMELE BROS., No. 32 Pine street, N. Y.

Liverpool Gas Oaking	$ 8 00@— —
" Cannel	12 00@13 00
" House	18 00@20 00
" Orrel	14 00@16 00

Per ton 2,240 lbs., ex-ship.

PRICES FROM YARD.

Liverpool House Orrel, screened	$14 00@16 00
"Cannel, "	19 00@23 00

Per ton 2,000 lbs. delivered.

Rates of Transportation to Tide Water.

BY RAILROAD.

TO PORT RICHMOND, PHILADELPHIA.

Philadelphia and Reading Railroad, from Schuylkill Haven for consumption ($1 85 less 55c drawback	$1 30
For reshipment	1 75

MAUCH CHUNK TO ELIZABETHPORT.

L. V. Railroad from Mauch Chunk to Phillipsburgh	$0 66
C. R. R., N. J., Phillipsburgh to Elizabethport	0 98
Shipping expenses at Elizabethport	25
Wharfage	10
Total	$1 99

MAUCH CHUNK TO PORT JOHNSON.

L. V. R.R., or L. & S. R.R. from M. C. to Phillipsb'g	$0 66
C. R. R., of N. J., Phillipsburgh to Pt. Johnson	0 98
Shipping expenses	25
Wharfage	10
Total	$1 99

TO HOBOKEN.

L. V. R. R., Mauch Chunk to Phillipsburgh	66
Morris & Essex R. R. Phillipsburgh to Hoboken	0 98
Shipping expenses	25
Wharfage	10
Total	$1 99

TO SOUTH AMBOY.

L. V. R. R.	66
B. & D. R. R. / Cam. & Am. R. R.	97
Shipping Expenses	35
Total	$ 198

PENN HAVEN TO ELIZABETHPORT.

L. V. R R. Penn Haven to Phillipsburgh	0 78
C. RR. of N. J. Phillipsburgh to Elizabethport	0 98
Shipping expenses	25
Wharfage	10
Total	$ 2 11

Freights.—June 1, 1872.

TO EASTERN PORTS.	Cumberland. From Georgetown.	Cumberland. From Baltimore.	Anthracite. From Philadelphia.	From Elizabethport, Port Johnston, and Hoboken.	From Newburg	From Rondout
Amesbury		3 00		2 00		2 30
Bangor				2 00		
Bath	3 00	3 00		2 00		
Boston	3 50	2 75	3 75	2 00	2 15	2 35
Bridgeport	2 50	2 40		1 00	1 15	1 25
Bristol				1 50		
Derby	3 00			1 25		
Dighton	2 60					
East Cambridge				2 00		
Fall River	2 50	2 50		1 50	2 35	
Hackensack					1 65	1 75
Hartford	2 75	3 00		1 60		
Hoboken	2 10			50		1 75
Jersey City	2 10			50		
Middletown				1 35		
Mystic						
New Bedford	3 00	2 50		1 60		
Newburyport	3 25	2 90		2 25		
New Haven	2 50	2 50		1 00	1 15	1 25
New London	2 50	2 75		1 25		
Newport				1 50	1 40	1 50
New York	2 25	1 90		50	1 65	1 80
Norwalk		2 75		1 00	60	65
Norwich	2 60	2 75		1 35	1 15	1 25
Pawtucket	3 00	2 50		1 60	1 50	1 60
Portland	3 00	2 90		2 00	1 75	1 85
Portsmouth, N. H	3 25	2 90				
Providence	2 50	2 50		1 50	1 65	1 75
Rockport				2 00		
Saco						
Sag Harbor				1 25		
Salem	3 00	2 75		2 00		
Stamford				1 00		
Stonington				1 25	1 15	1 25
Taunton				2 00		
Warren				1 50		
Washington						
TO RIVER PORTS						
Albany		2 40			55	
Catskill					50	
Cockaackie					50	
Coeyman's					65	
Cold Spring		2 25			20	
Fishkill					20	
Haverstraw					40	
Hudson	2 50	2 40			40	
New York						
Nyack					45	
Poughkeepsie	2 50				30	
Rhinebeck					30	
Rondout					30	
Saugerties					40	
Sing Sing					50	
Stuyvesant					55	
Tarrytown					50	
Troy		2 50			75	
West Point					20	
Yonkers					50	

MARKET REVIEW.

FOR THE WEEK ENDING MAY 30, 1872.

IRON—The market for Scotch Pig is in an unsettled condition—several parcels from recent arrivals have gone into store and bond, holders not caring to sell at present prices; we quote the market however weak, at from $47, 50 to $53, as to brand, but these prices are nominal; the only sale we hear of is 200 tons Glengarnock, to be delivered in 60 days, at $47, 50 ₱ ton. American Pig continues very scarce, and prices are firm at $50 @$52 for No 1, $49 @ $50 for No. 2, and $47 @ $48 for Gray Forge, with sales of 100 tons No. 1 Lehigh delivered at Hoboken at $50, prompt cash. Rails are in rather better request, but the market is still rather quiet at $50 @ $51 for old, and $72 @ $73 for new, both gold, with sales of 2000 tons new English from store at $72 gold, and 2 @ 3000 do. delivered at Galveston during the Summer, and 75 do. old here, on terms not made public.

New American rails are in more demand at about $82,50 @ 85 at the mills. Scrap Iron is very quiet, and prices are nominal at $55 @ $57,50, with sales of 50 tons, on private terms. The same firm feeling for Bar heretofore noticed, continues, and appearances indicate rather an advance than a decline, judging from the prevailing sentiment of the Trade.

PHILADELPHIA, May 27.—(From Circular of Edward Samuel.)—Lehigh is without change. Some few brands of Schuylkill Iron have been sold at considerable concessions. Scotch, owing to the large stock now here and due, is dull, and lots have been offered at $2 @ $3 below quotations, without finding buyers. The general impression is that, July and after, the markets will be active in Raw Irons. Manufactured Iron remains unchanged.

The British Board of Trade returns give the following amounts and values of all kinds of Iron exported to the United States during the first four months of 1871 and 1872:—

	Tons.		Value.	
	1871.	1872.	1871.	1873.
Pig Iron	54,449	61,483	£176,353	£271,144
Bar, Angle, Bolt and Rod	15,870	25,928	128,874	248,930
Railroad Iron	135,421	180,193	1,025,420	1,603,957
Hoop, Sheet and Boiler Iron	10,430	9,524	101,681	113,880
Total	216,170	277,128	£1,432,328	£2,237,911

This increase, in connection with the steady growth of production of American Iron, indicates a very heavy consumption of this most important of all metals.

COPPER—There have been no further changes in the prices of Manufactured Copper or Yellow Metal, and we quote as before, say Sheathing Copper 43 cents, Braziers and Bolts 45, Bronze and Yellow Metal Sheathing 30, and Y. M. Bolts 32. Telegraphic advices were received from London yesterday announcing a further advance there of £5 ₱ ton, bringing Chili Bars up to £106 10s., Tough Cake £111, and Best Selected £113. There is no response here however; on the contrary, with a limited demand, and the season now here for liberal supplies of Domestic, prices of Ingot are again rather lower. The first shipments of Lake Copper hither have come to hand since our last. The business embraces about 100,000 lb. Lake in lots for immediate delivery at 33 @ 34 cents, closing at 33 @ 33½; 100,000 lb., for June, 33½; Small lots Best Selected English 32½ @ 33½; and 500,000 lb. Lake, for August, and September delivery, on private terms; 33½ @ 34 is now the quotation for "futures." In old Copper we note sales of 4000 lb. at 26 cents; and 20,000 lb., to arrive, at a private price.

LEAD—Foreign Pig is quiet, but firm—150 tons Spanish sold at 6⅞ cents gold: the Government have done little or no business since the price was advanced to $6,40 gold; Bar 8¾ cents, Sheet and Pipe 10½, domestic 11c. currency, and Tin lined Pipe 15 cash, less 10 ₱ cent. to the Trade.

SPELTER—Remains dull. Silesian may be quoted nominally 7 @ 7¼ cents gold for ordinary good brands.

STEEL—The market continues steady and firm at our quotations for lots as wanted from store—some leading sizes of Cast are in very small stock.

TIN—The market for both Pig and Plates has come to a stand, pending final Congressional action on the new tariff bill. The bill, as revised by the Senate, places Pig Tin on the free list, and imposes a duty of 15 ₱ cent. *ad val.* on Plates—now 25 ₱ cent. Prices of Pig are wholly at 38½ at 39 cents gold for Straits and English. Our quotations for Plates represent market values as near as may be in the absence of business.

As usual with a dull market, there is a little relaxation here and there, though holders generally evince considerable confidence, as the markets of England are still very strong.

BATAVIA, March 30.—(J. Peet & Co.)—Tin, Billiton—Last auction averaged f. 87.88 ₱ picul. The next sale is advertised for the 8th proximo, when 8000 piculs will be sold, and the periodical auctions will in future consist of this quantity. High prices are expected to rule at the April sale, in sympathy with the home markets. The production of the island of Billiton has been as follows:—During 1865-6, 15 139 piculs; 1866-7, 25'043 piculs; 1867-8 32,970 piculs; 1868-9 30,316 piculs; 1869-70 36,166 piculs; 1870-1, 47,319 piculs; 1871-2, 49,850 piculs. The production of the island of Banca during 1871 was 67,453 piculs, or 6047 piculs less than 1870.

ZINC—Sheet continues dull at previous figures—20 casks Mosselmann sold from dealers hands, at 8¼ cents net gold. White oxide French 9½c. gold; white oxide American 10c. currency: maganese black oxide 3½c.; maganese gray peroxide pyrolusite 6c.

From a circular of Messrs. Baring. Bro's, & Co. dated London, May, 10, 1872, we have extracted the following intelligence in reference to metals.

IRON—Very firm. Weardale Steel Rails (Bessemer) $15, Plates £2I, Pigs 100s. cash, W. B. Pigs 80, cash; Tudhoe Bars £12, Hoops £12 10s; Nail Rods £11 10s., Plates £14, all f. o. b. on Tyne. Welsh Rails and Bars £10 10s. at £10 15s. f. o. b. in Wales, 6 mos. Scotch Pig 94s. 3d. at 94s. 6d. cash, for mixed Nos. on Clyde.

LEAD—In better demand; common Pig £20a£20 10s.

COPPER—English in large demand at £105 for Tough Cake and Ingot, and £108 for Best Selected. The high price asked for foreign have checked business; we quote to-day Chili Bars £102 at 102 10s. Urmeneta Ingots £106.

SPELTER—Firm at £23 at 23 2s. 6d.

TIN—English steady. Blocks and Ingots 163s., Bars 164., Refined 165. Prices of Foreign rather irregular—Straits 154s.a155s.. Banca scarce at 162s.a163s.

METALS.

NEW YORK, May 30, 1872.

IRON.—Duty: Bars, 1 to 1¼ cents ₱ lb; Railroad, 70 cents ₱ 100 lbs.; Boiler and Plate, 1½ cents ₱ lb; Sheet, Band, Hoop, and Scroll, 1¼ to 1¾ cents ₱ lb; Pig, $7 ₱ ton; Polished Sheet, 3 cts. ₱ lb; Galvanized 2½; Scrap Cast, $6; Scrap Wrought, $8 per ton.

	Store Prices.
Pig, Scotch No. 1, ₱ ton	47 50@53 00
Pig, American, No. 1	50 00@52 —
Pig, American, No. 2	49 00@50 —
Pig, American, Forge	47 00@48 00
Bar Refined, English and American	— —@105 00
Bar Swedes, assorted size (o)	— —@160 00
	Store Prices, Cash.
Bar, Swedes	125 00@135 00
Bar, Refined, ¾ to 2 in. rd. & sq. 1 to 6 in. x ¾ to 1 in.	110 00@— —
Bar, Refined, 1¼ to 6 by ½ & 5:16 & 2½ to 2½ rnd. sq..	115 00@— —
Bar, Refined, 1 & 1½ by ¼ & 5:16	117 50@— —
Large Rounds	122 50@127 50
Scroll	122 50@152 50
Ovals and half-round	127 50@137 50
Band	— —@122 50
Horse Shoe	120 00@130 00
Rods, ⅜ to 3-16 inch	115 00@155 00
Hoop	135 00@177 50
Nail rod	8 @— —
Sheet, Russia, as to assortment (gold)	— 18 19 —
Sheet, Singles, D. and T. Common	—6¾@— 7¾
Sheet, D. and T. Charcoal	—7¾@— 9
Sheet, Galv'd, Nos. 10 to 27, list 10 per cent discount	—@— —
" " Nos. 28, and 29.	—@— —
Rails, English (gold), ₱ ton	72@73 —
Rails, American, at Works in Pa.	82 50@85 00

COPPER.—Duty: Pig, Bar, and Ingot, 5; old Copper 4 cents ₱ lb; Manufactured, 45 per cent. ad val.

	All Cash.
Copper, New Sheathing, ₱ lb	— @— 43
Copper Bolts	— @— 45
Copper Braziers, 16oz. and over	— @— 45
Copper Nails	— @— 45
Copper, Old Sheathing, &c. mixed lots	29 @— 30
Copper, Old, for chemical purposes, 14@16 oz.	— @— —
Copper English Pig	32½@— 33
Copper, American Ingot	33 @— 33¼
Yellow Metal, New Sheathing & Bronze	— @— 30
Yellow Metal Bolts	— @— 32
Yellow Metal Nails	30 @— 32

LEAD.—Duty: Pig, $2 ₱ 100 lbs.; old Lead, 1½ cents ₱ lb; Pipe and Sheet, 2½ cents ₱ lb.

Galena, ₱ 100 lbs	$— —	@— —
Spanish (gold)	6 50	@6 62½
German, do.	6 50	@6 62½
English do.	6 62½	@7 12½
Bar (net)	8 75	@— —
Pipe (net)	— —	@10 50
Sheet	— —	@10 50

Colwell, Shaw & Willard Tin-Lined Lead Pipe 15 cts. ₱ lb.

STEEL.—Duty: Bars and ingots, valued at 7 cents ₱ lb or under, 2¼ cents; over 7 cents and not above 11, 3 cents ₱ lb; over 11 cents, 3½ cents ₱ lb, and 10 ₱ cent ad val. (Store prices.

English Cast (2d and 1st quality) ₱ lb	—	16½@— 18½
English Spring (2d and 1st quality)	—	7½@— 10½
English Blister (2d and 1st quality)	—	10½@— 17½
English Machinery	—	11½@— 13½
English German (2d and 1st quality)	—	10½@— 12
American Blister "Black Diamond"	—	—@— 12
American, Cast, Tool do.	—	15 @— 16
American, Spring, do.	—	9 @— 11
American Machinery do.	—	10 @— 10½
American German, do.	—	—@— 11

TIN.—Duty: Pig, Bars, and Blocks, 15 ₱ cent. ad val.; Plate and Sheets and Terne Plates, 25 ₱ cent.; Roofing 25. ad val.

	Gold ₱ lb.
Banca	50 @51
Straits	38 @39
English	38 @39

PLATES.

Fair to Good Brands.	Gold.	Currency.
I. C. Charcoal, ₱ box	$13 50 @14 00	$15 25 @15 50
I.C. Coke	12 25 @13 25	14 00 @15 00
Coke Terne	10 50 @10 75	12 00 @12 50
Charcoal Terne	12 25 @13 00	14 00 @15 00

SPELTER—Duty: In Pigs, Bars & Plates, $1.50 p. 100 lb

Plates, Foreign (gold) p. 100 lb.	7 00	@ 7 12½
Plates, Domestic p. lb.	— 8	@— 11

ZINC—Duty: Pig or Block, $1.50 per 100 lb.; Sheet 2½c. per lb

Sheet per lb.	— 9¼@— 10¼

San Francisco Stock Market.

BY TELEGRAPH.

OUR report from the San Francisco Stock Market is dated the 28th instant. With the exception of a slight decline in Kentuck the market has advanced. Belcher as usual heads the list the report placing it at $1,050 per share, an advance of $370 compared with our last. It will be observed on a comparison of the two following reports that excepting a slight advance in Imperial and Belcher, the list has materially *declined* since the 23d instant. If any of our readers can gather any information from the reports of the San Francisco Stock Board which will point to a probability as to its future course it is more than we can do. Judging from the quotations which have characterized the proceedings of the Board for the last two months, all the rules which ordinarily govern the value of stocks seem to have been set a naught and a series of quotations given us which has been a surprise, to everyone who has been at all conversant with the transactions of the Board, and no doubt to many of those who have manifested a deeper interest in the proceedings of the market than merely looking at the quotations; the surprise has terminated into a realization of the discouraging pecuniary results accruing from such uncertain investments. It is quite probable however, that if every one profited by their unprofitable experience in their purchase of stocks, and also if the lesson so learned had its proper effect with those inexperienced who were about to invest, nine-tenths of the life and animation of the Board would be lost. So, gentlemen, that the spirit of enterprise so eminently characteristic of the San Francisco Stock Market may not suffer, proceed with your investments.

		May 23.	May 28.
Savage	—	205	155
Crown Point	New Issue,	136	122
Yellow Jacket	—	140	127
Kentuck	—	350	300
Chollar Potosi	—	110	90
Gould & Curry	—	200	165
Belcher	—	950	1050
Imperial	—	190	210
Hale & Norcross	—	—	—
Eureka G. V.	—	—	17½

TO OWNERS OF MINES.

The "St. Louis Smelting and Refining Co.,"

will commence operations on the 1st of July, when they will be prepared to smelt ores of Silver and Gold, or refine Base Bullion, on commission or to purchase the same. Correspondence is solicited from all parties having these materials for sale or reduction, stating the character of the ore and the amount which may be depended on for regular supply, whenever such parties propose to furnish material regularly.

Address: J. H. HOWARD, Gen'l Sup't,

June 4-2m 515 Chestnut street, St. Louis, Mo.

THE

SCIENTIFIC PRESS, FOR 1872.

VOL. XXIV.

The weekly issues of the PRESS will contain reliable

Information for Practical Miners,

Treating on the Opening of Mines, Mining of Ores, Milling of Ores, Smelting of Ores, Separation and Roasting of Ores, Amalgamation, Saving of Gold and all Precious Metals, New Processes of Metallurgy, New Discoveries of Mines, Mining Engineering and Hydraulics.

For Inventors, Mechanics and Manufacturers.

All new and important developments in Scientific and Mechanical Progress, Patents and Inventions of the Pacific States, Progress of Home Industries, Hints for Local Manufacturers, Illustrations of New Machinery, Reports of Popular, Scientific and Industrial Lectures.

Our Mining Summary

Gives the progress of mining work from week to week in the various counties and districts throughout the principal mining regions of the United States, arranged in alphabetical order. It is the most extensive record of mining operations published in the world. It affords the intelligent miner a rare opportunity to know and profit by the work and experience of his neighbors. Miners have few sources of practical information in their calling, and should embrace every reliable means for improvement. Mining Operators and Shareholders, at home and abroad, weekly examine our Summary with increased interest and profit.

Our "Domestic Economy"

Embraces new and important facts which should be known in every cabin and household. Short and interesting—the articles under this heading are freely read and practiced with profit and improvement to the readers.

The PRESS is not strictly a "paper for professional, scientific men" but rather a

Liberal Popular and Scientific Journal,

Well calculated to make practically scientific men from our intelligent masses. This is our stronghold for accomplishing good. Plain, correct and pleasing language, easily comprehended by all, confined mostly to short articles, is our endeavor.

The New and Novel Developments

in the progress of this comparatively new section of the Union, but recently settled and now rapidly increasing with a population of the most intelligent and venturesome people, attracted from nearly every quarter and clime on the globe, enable us, with due enterprise, to display vigor and freshness in our columns, not met with in similar journals elsewhere.

Hundreds of Dollars

are oftentimes saved to the readers of this paper by a single hint or article of information in its columns; such instances have been repeatedly reported to the editors and proprietors during their long connection with the PRESS. Our paper presents

A Great Variety of Industrial Information,

in brief and fresh form, suited to the wants and tastes of the readers of this country, which is not obtainable otherwise so timely or in so cheap and convenient form. As an industrial publication, meeting the wants of so many kindred industries this journal stands pre-eminent and without a precedent.

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Subscriptions, payable in advance, $4 per annum. Single copies, post-paid, 10 cents. Four sample copies 25 cents. Address DEWEY & CO.,

Publishers, San Francisco.

Communication between France and England.

THERE is at length a very good prospect that the long-talked-of improvement in the means of communication between France and England will be speedily made. Probably no other link in the great chain of the world's intercommunication has been so much conned as this, or has given rise to so many suggestions, bold, novel, sensible, foolish, or otherwise qualified. But, until now, timidity has had the mastery, and the channel has been crossed by the smallest and meanest steamers used anywhere in the world for a great traffic. MR. JOHN SCOTT RUSSELL has been engaged with other engineers, for several years, in studying a plan for improving the line, and at a session of the Institution of Naval Architects in England, explained what results he, in connection with government committees in France and England, had reached One of his colleagues, we should say here, is M. DUPUY DE LOME, celebrated for his acquirements as a naval engineer, and lately Constructor of the French Navy. Their plan includes the transport of railway trains between Calais and Dover on large steamers, but this part of the plan was not brought out in detail, MR. RUSSELL'S explanations referring mainly to the harbor which is to be established off Calais.

The present harbor of Calais will not answer. It is merely a little inland stream, deepened enough to hold a few boats at high water, and with channel deep enough for some boats at low water. MR. RUSSELL (who gave his information in a rollicking "popular" sort of style, which seems very inapplicable to subjects of this kind, and really obscured a most interesting narration) gave the following account of the method taken to improve the harbor :

"Imagine an inland stream turning down through a line of coast. When they wanted to deepen the inland stream to hold vessels, what they did was to dam up the water and scour the channel out. They dammed up the water, they opened the sluice, and scoured the channel out. And this stream of water scoured the channel out, and all the stuff was put up in a pretty heap in front. That is what the water did; but it took ten years to do this in an intolerable manner, and during that ten years there was something like a deepish channel. After ten years the engineers, looking not too far ahead, but being, as we would call them, moderate practical men, said, 'Oh, we will soon get over that difficulty.' 'Let us run out a long row of piles'; and they did so. They put out a pier, and at the end a lighthouse, thinking that that was the end of the whole difficulty. They then said, 'Let us take a large reservoir of water inside; we will confine it, and then we shall have a bigger rush, and see if it will not sweep this impediment away.' They dammed up the water; they then let it out, and it swept away the impediment, and they said, 'See what a harbor we have made for Calais.' This went on day by day, and then gradually they had taken all the stuff away from where they had first placed it, and deposited it a little further out. That was ten years' more work. Then they said, 'Oh! Now we know how to cure that very easily;' and then they began to do the same thing over again. The lighthouse was shifted out, the piers were continued, and the embankment was carried out further. That is the history of the fifty years of my personal intimate acquaintance with the harbor of Calais."

Considering the difficulties of digging a harbor out of the land, and the constant efforts of nature to recover the soil that had been taken from her, the engineers determined to do the opposite thing, and make a harbor by inclosing a portion of the sea by artificial land. The scheme which has been adopted is, to build an island off the French coast, the island consisting of a ring of land inclosing a sheltered bay. It is, in fact, a *fac-simile* of the atolls or annular reefs which are formed in coral-making seas. Natural harbors usually consist of a bay opening towards the sea, and are therefore subject to the dangers arising from storms and waves sweeping in towards the land. On the other hand, the measures used to overcome this danger all tend to the filling up of the harbor. The artificial harbor is to have its entrances towards the land, and as it will be placed in the open sea, and have no currents, except the tides entering it, it is not expected to silt up. The island is to be connected with the main land by a railway viaduct, and the waves only break upon it in this standard direction which I have shown, and the waves are so utterly broken upon this coast—so utterly broken to pieces—that there is not what you have upon a rocky or precipitous coast, a reflected wave. The consequence is that we have only to protect ourselves against those. The task, therefore, is by that circumstance rendered easy, and the harbor appropriate to the situation. This line, the extension of the Northern Railway of France, is to be by a viaduct on screw piles, hollow. concrete piles, and matters of that kind, on to this island. The island is a quay of concrete and of iron. This quay has all around it lines of railway. These lines of railway begin at a certain level, and go gradually down to the level of high water. At one quay the boat which has to embark a load at high water embarks it, or the contrary. At a second quay the boat which has to embark a load, or the contrary, at mid-water, embarks it. At a third quay the boat which takes in or gives out a train at low water, embarks in it, or the contrary."

In the construction of the island there are very important considerations to be attended to. The harbor is to be round, 1,000 feet in diameter, or 1,000 yards in inner circumference. This will give room for three of the company's large railway ships at one time. After a study of the winds and tides at Calais, it was thought best to arrange for entrance in one direction and departure in another, and the angles for both were fixed. Such a harbor and the ships that are to use it could be made for about one million pounds. But the problem had been so well worked out, that the new kind of harbor, from having been strongly objected to, became fashionable, and the projectors had to increase it to admit ordinary traffic, including sailing ships. The exact changes made to fit the harbor to this new condition of things were not described, because there is still some difference among the engineers as to the details.

On the English side the present harbor of Dover, with perhaps some improvements, will be used. The following extracts from Mr. Russell's address will explain under what circumstances he considers the new form of harbor available :

"The harbor of Calais presents a long drift of solid sand, and a great sandy shore, covering chalk, gradually tending down from high water to low water; it is about a kilometre or 5-8ths of a mile from the shore to the low-water line, and the high and low-water difference is something like 18 or 20 feet, so that the sandy shore of Calais is a very gentle incline. For our purpose we call deep water from 20 to 23 or 24 feet. We had to study for a long time the waves breaking on the shore to find which way they broke; what were the prevalent winds, and which way the heavy seas came. . . . There is the entrance to Calais harbor at low water; there are the ordinary sand banks in front of it; and outside, and clear of all these things the deep water we were in search of. . . . . Now, one word more about waves, because there may be a great blunder made if you fancy the arrangement I have shown you is as good for a precipitous coast as for this long slow sloping one which I have described. Were this a precipitous rocky coast we should not have at all the advantages of this arrangement we have here. With a rocky coast you would have great waves striking and being reflected. This harbor is locally protected on the west side by the form of the coast, and the waves only break upon it in this standard direction which I have shown, and the waves are so utterly broken upon this coast—so utterly broken to pieces—that there is not what you have upon a rocky or precipitous coast, a reflected wave. The consequence is that we have only to protect ourselves against those. The task, therefore, is by that circumstance rendered easy, and the harbor appropriate to the situation. This line, the extension of the Northern Railway of France, is to be by a viaduct on screw piles, hollow. concrete piles, and matters of that kind, on to this island. The island is a quay of concrete and of iron. This quay has all around it lines of railway. These lines of railway begin at a certain level, and go gradually down to the level of high water. At one quay the boat which has to embark a load at high water embarks it, or the contrary. At a second quay the boat which has to embark a load, or the contrary, at mid-water, embarks it. At a third quay the boat which takes in or gives out a train at low water, embarks in it, or the contrary."

Nothing is given about the method of constructing the harbor, but the general features of the work will suggest themselves to every engineer. The steamers are to be long, wide and deep enough for stability. They will carry freight trains as well as passenger, taking two trains at a time.

We do not know what kind of an audience Mr. Russell had but we should think he would get little thanks from a meeting of *naval architects*, for a description in this style of so important a work. The project seems to be rather a sensible adoption of known engineering expedients, and their adaptation to the existing circumstances, than the discovery of anything new. As a general principle, the enclosure of deep water for a harbor seems to be in itself greatly superior to the old method of digging one out of the land.

Tin Ore in America.

After many false alarms *real* tin ore seems to have been discovered in North America, in a spot where it can probably be made available. We already know of tin stone in Mexico, which from its richness, if the samples brought are fair specimens, might give America the lead in producing the tin of the world. But the deposit is in the interior of Mexico, the specimens were brought to this country while the bitter war against Maximilian was in progress, and we do not know that the existence of the mines has ever been verified. By the following, which we take from the *Gaslight Journal*, it will be seen that there is good reason for anticipating important discoveries of this ore in a more accessible region.

At the meeting of the New York Lyceum of Natural History, April 29th. Prof. Henry Wurtz exhibited some beautifully crystallized specimens of heavy tinstone or cassiterite, discovered a few months since on the most northerly shore of Lake Superior, near Neepigon Bay. The parties who brought them say they were shown a line of boulders, strung through a ravine from near the lake shore for a long distance inland. "This float is in large irregular masses, made up almost entirely of a very heavy mineral resembling hematite iron ore, and strewn over the surface in quantity." About 2,500 pounds of these boulders, together with about 200 pounds of the black ore, which they took out as samples, were lost by the swamping of their boats. They helped to mine, pack, and boat all these ores to Point Aux Pins, and shipped them from there to Marquette by the propeller Cuyahoga, and from there to Detroit per express.

This tin-stone has been analyzed by Dr. John Torrey, with the following result :

U. S. ASSAY OFFICE.
NEW YORK, December 29, 1871.

W. H. STEPHENS, Esq.,

Dear Sir : I have assayed the sample of tin ore from the north side of Lake Superior, left with me by H. Pennock, Esq., and report on it as follows :

The ore is a true tin stone or *cassiterite*, mixed with quartz ; some of it is massive, but a considerable portion of the specimen examined is in the form of small, translucent quadrangular prisms, some of which are perfectly terminated. The average of the samples yielded 33.3 per cent. of metallic tin. It would be easy to concentrate the pulverized mineral to a considerably higher *per centage* of metal.

Yours respectfully,
JOHN TORREY.

American Institute of Mining Engineers.

OFFICIAL BULLETIN.

Announcements to Members and Associates.

I. The dues for the year ending May, 1873, are now payable. All members and associates who have not paid their dues are requested to do so at once, by sending in postal orders, or checks, or money, ten dollars to the Secretary.

All members and associates who pay their dues for each current year, strictly in advance, will have sent to their address, regularly and weekly, the ENGINEERING AND MINING JOURNAL, which is the organ of the Institute, and will contain the proceedings and transactions, and all important papers read before the Institute, and all notices of meetings. Back numbers cannot, as a general rule, be sent.

II. It is expected that the more important papers read before the Institute, and the debates thereon, will be published in annual or occasional volumes to which those members and associates will be entitled who have paid their dues.

III. Authors of papers are requested to notify the Secretary in advance of the meetings, giving the subject and length of their papers. Attention is also called, in this connection, to Rules 12 and 13.

IV. The ninth rule has been amended, so that there will be hereafter three meetings a year, in February, May and October. The meeting next October will be held at Pittsburgh, Pa.

MARTIN CORYELL, Secretary.
WILKESBARRE, Pa.

THE ENGINEERING AND MINING JOURNAL.

ROSSITER W. RAYMOND, Ph. D., Editor.

PUBLISHERS' ANNOUNCEMENT.

THE ENGINEERING AND MINING JOURNAL *is projected in the intent of furthering the best interests of the Engineering and Mining public, by giving wide circulation to original special contributions from the pens of the ablest men in the professions. The careful illustration of new machinery and engineering structures, together with a summary of mining news and market reports, will form a prominent feature of the publication.* It is the Organ of the American Institute of Mining Engineers, and is regularly received and read *by all the members and associates* of that large and powerful society, *the only one of the kind in this country.* It is therefore the best medium for advertising all kinds of machinery, tools and materials used by engineers or their employees.

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Notice.

THIS number of the ENGINEERING AND MINING JOURNAL will be sent to all members and associates of the American Institute of Mining Engineers who paid their dues last year, and to all who were elected at the New York Meeting. We shall continue to send the Journal in this way for a few weeks, to give all an opportunity to pay the dues for the present year, and not to lose any numbers of the paper by reason of a slight delay in such payment. But members and associates will please bear in mind, that if they do not at once pay up (by remittance to MARTIN CORYELL, Esq., Wilkesbarre Pa., Secretary,) their respective $10, they will have no right to complain, should the Journal be suddenly stopped, and should *no back numbers* be afterwards available, for love or money.

Editorial Changes.

Moving day seems to have been a day of change among the editors of the New York technical journals. We learn that Mr. ALLEN, formerly of the *Scientific American*, has purchased a share in the *Artisan*, and assumed editorial control of that paper. His place on the *Scientific American* is taken by Messrs. KNIGHT and BENJAMIN, the latter of whom has hitherto been employed on the *Manufacturer and Builder*, where our old friend Dr. VAN DER WEYDE now appears to be left alone in his glory.

Mr. JAMES A. WHITNEY, President of the Society of Practical Engineering, and late editor of the *Artisan*, has opened an office as consulting engineer and solicitor of patents, at No. 128 Broadway. His extensive acquaintance with the literature, practice and men of his profession should assure him success. We take pleasure in announcing that we have secured Mr. WHITNEY as a regular contributor to the ENGINEERING AND MINING JOURNAL.

It seems that our semi-funereal notice of Mr. WARD's departure, some weeks ago, deceived many of our readers. who (not having visited either land of the saints) did not clearly see the difference between going to Utah and going to Heaven. We hasten to say in plain terms that WARD is not dead, but very much alive—and apparently not as unhappy about his absence from this office as we think he ought to be.

A State Inspector for South Carolina.

WE are pleased to hear of the appointment of Dr. OTTO A. MOSES, a graduate of Freiberg, to the newly created office of State Inspector of Phosphates. The duties of the position are to protect the most valuable possessions of the State from waste, and in addition to make frequent analyses of all commercial fertilizers, and to brand all packages in accordance with obtained results.

The responsibilities attached to the office may be estimated from the fact that between three and four millions of dollars have been invested in the most complete plants for mining, and for manufacturing the rock into superphosphates. At this moment about 12,000 tons of "Phosphate" is extracted each month; and the nine superphosphate factories in or near Charleston have a producing capacity of 100,000 tons per annum.

The name of Dr. MOSES is already familiar to the later students at Freiberg as the inventor of the most convenient "geblaese," or blowpipe-holder and bellows and lamp, which has ever been made. It is made by LINGKE of Freiberg, and is an exceedingly ingenious piece of work and a great help to the blowpipist.

Fire-Damp from Anthracite.

OUR readers will be interested, perhaps painfully so, in the following information upon the fiery anthracite mines of Pennsylvania. The discovery is one of financial importance, not merely to the mines in question, but to all the coal mines, for this unexpected development of fire-damp in some of the anthracite coal mines will probably lead the government, sooner or later, to increase the burden of inspection in all the mines.

One of the most surprising developments of later times, says the *Gas Light Journal*, has been the sudden phenomena of "fiery" mines in the Pennsylvania anthracite fields, especially in the most northerly one, known as the Lackawanna or Wyoming basin. It is but a few years since we congratulated ourselves, when reading periodically of the immolation of victims, hundreds at a time, in the British mines, on the supposed fact that we were, and would doubtless continue to be, almost if not quite free from this horror; as our bituminous coal fields have so immense an area superficially that the time appears very remote in the future when it will be necessary, or say profitable (two words which are in fact synonymous, in a "business" point of view) to go down *deep enough* for the development of fiery mines; and as to the anthracite beds, they were universally believed to be free from this drawback.

Our eyes have, however, been sadly opened of late, and a new case reported (May 11), in which three engineers surveying a suspended mine near Wilkesbarre were instantly killed, and a fourth narrowly escaped, induces us to direct attention to the subject. It is clear that we shall, in the future, have the same experiences to go through as our British cousins, and, unless we take time by the forelock and institute such thorough scientific investigation and devise and *enforce* such wise and efficient laws as have been so much talked about and quarrelled over for half a century in the mother country, we shall soon have similar dreadful catalogues of death to report in our annual statistics.

It is a subject which appeals to the duty and humanity of every citizen, as every one is more or less dependent on the labors of these miners, and the case is therefore one appropriate for the consideration of the general government, rather than of local or state authorities. Let there be then a Scientific Commission created at once, comprising skilled chemists and gas-analysts, to investigate the subject of the safe lighting and ventilation of mines, and the application of the newest discoveries thereto; and let their report be submitted to eminent jurists who shall frame a law, that shall rise to the spirit of the age in enforcing such management as shall protect this class of our citizens against both the cupidity of employers and the results of their own recklessness.

Congress and Science.

WE notice in the Sundry Civil Expenses Bill, as reported the other day to the House of Representatives, several items of specially noteworthy and praiseworthy character. Noteworthy, because they indicate a growing tendency in Congress to be judiciously liberal in aiding the systematic exploration of the great country in its charge, and the application of science to its government and indirectly to its development. This feeling suffered a reaction after the expensive publication of the Pacific Railroad Reports, and was almost entirely suppressed during the war. But the appreciation of the value of scientific knowledge has made rapid strides among our people; and we think no appropriations voted by Congress wil be more heartily approved than those which are directed to scientific objects.

We need say nothing of the money ($828,250) devoted to the continuation of the usual land surveys. These are imperatively necessary, and it would be folly to withhold it. The extension of meridians and section-lines over the public domain is the first step in its reduction to law, order, and civilization. It is true that our impatient and indomitable pioneers, particularly miners, have frequently settled whole districts and built towns in advance of the government surveyors; but everybody knows that many evils and inconveniences have arisen from this state of things. Especially the waste of timber in the far West, by reckless cutting and forest fires can be remedied only, we think, by the survey and sale of the lands.

The appropriation of $225,000 for the Signal Service is an appropriate recognition of the value of this new agency. "Old Probabilities" and his weather reports are household words already throughout the country, and the value of his predictions is amply established. But perhaps few persons realize that this is but one, and possibly the least, of the benefits which may be expected from close, careful and continuous meteorological observations of this kind.

The $75,000 granted for the continuance of Dr. HAYDEN's geological surveys of the Territories is likewise commendable. The last report of Dr. HAYDEN covers a portion of the now famous Yellowstone region, and describes with fidelity the wonders of nature which there abound. Such a display of the beauties, as well as the resources of America is calculated not only to promote the settlement of our country, but also, in no insignificant degree, to foster the spirit of patriotism and unity among our people. The Swiss are not alone in blending local pride with political independence. The phenomenon is universal; and the natural wonders of our land are part of the inheritance which we mean to keep unbroken. Moreover, Dr. HAYDEN's discoveries and collections have thrown much light upon

a new and fascinating chapter in geology—the history of this continent.

Similarly interesting, though less fruitful of results, is Powell's exploration of the Colorado cañon and its branches, for which $20,000 have been voted. This work is under the direction of the Smithsonian Institution.

We note also an appropriation of $75,000 for the continuance of military surveys, which we trust refers to the continuance of the work of Lieut. WHEELER and of CLARENCE KING. The latter gentleman has been fortunate in having, from the outset, a liberal support in his enterprise; and the volumes which have thus far appeared of his *Geological Exploration of the Fortieth Parallel* have been highly creditable to him and his associates. WHEELER's explorations have been less detailed but more dashing and dangerous. We owe to him much information concerning Arizona, in which Territory, it will be remembered, the brilliant young LORING, one of WHEELER's party was recently killed by the Apaches.

The collection of statistics of mines and mining is set down for $15,000—rather a small sum, we should think, with which to carry on any systematic work in twelve States and Territories. But the appropriations in this department have been for several years past only $10,000 per annum, and this may be considered a gratifying advance. The statistical part of the work must be imperfect and unsatisfactory, so long as the appropriation does not permit the employment of resident agents in the different districts; but another feature of the Commissioner's annual reports is the discussion of the current domestic and foreign methods and machines, which has proved most welcome and useful to our infant gold and silver mining industry.

There are $15,000 set down for the erection of a salmon-breeding establishment on the Pacific coast, and a similar one for shad on the Atlantic coast, and $5,000 for continuing the inquiry into the causes of the decrease of food-fishes of the coast and lakes.

The Botanical Garden at Washington receives $18,000 for new constructions, besides the usual cost of maintenance; and the Smithsonian Institution $10,000 for the preservation of the collections of the governmental exploring parties, and $10,000 for the completion of a hall for them.

Astronomy is not forgotten. There is a modest grant of $2,000 to enable the superintendent of the Cost Survey to make observations from the highest point of the Pacific railroad; and moreover, the transit of Venus in 1874 is to be prepared for on a grand scale, $50,000 being the first of a series of annual appropriations proposed for that purpose. Then there is the regular appropriation of $722,000 for the Coast Survey.

We have not exhausted the list; but we have gone far enough to show that our government is not backward in availing itself of the aid of science. When we consider, in addition to all special enterprises on foot, how many scientific men, such as the experts of the Patent office, the Surgeon General's office, the Engineer Corps, etc., are constantly in the public service, and have reflected glory upon the country by their reports, constructions and discoveries in science, we are justified in saying that we do not think any foreign government can present, on the whole, a better record.

A company which desires to tunnel the East River, New York, proposes to incorporate under the name of "The New York and Brooklyn Submerged Tubular Bridge Company." Probably the incorporators are English. Certainly they must be unacquainted with that form of the English language which is spoken in America. A tunnel is a tunnel and may as well be called so, just as a ferry does not need to be styled a flying bridge. We hope the use of English technical nomenclature will not increase among us. Our own terms are just as appropriate and take their form from the characteristics of American life and modes of thought.

About-Town Jottings.

BUSINESS AND PERSONAL.

Personal announcements and business notices inserted in this column, at fifty cents per line.

Root's Wrought Iron Sectional Boiler, manufactured by the Root Steam Engine Co., 500 to 510 Second Avenue, New York.

Utica Steam Engine Co. (formerly Wood & Mann Steam Engine Co.,) 42 Cortlandt street, N. Y.

Post & Goddard have removed to No. 111 Liberty street. Dealers in Taps, Dies, Reamers, Drills and supplies generally.

American Submerged Pump. Power attachment—cheapest and best in the market, 55 Chambers street, N. Y.

Roper Caloric or Hot Air Engine, 124 Chambers St.

Blake Bros., New Haven, Conn., manufacture Stone Breaker for crushing ores and minerals of every kind into small fragments, preparatory to their further comminution by other machinery.

Alabama's Resources.

Report on Iron and Coal made to the Board of Trade by Geo. M. Stewart, Esq.

CONTINUED FROM PAGE 299.

The distance from Birmingham, the railroad center of the mining region, to Mobile, is 231 miles. The Grand Trunk location at that place is 576 feet above low tide water. The highest point of elevation of the whole railroad track between there and Mobile is where it passes through Gracie's Gap, 3½ miles this side of Birmingham. The grade of the road to reach that point does not exceed a rise of 39 6-10 feet to the mile, with a proportional reduction on curves, and indeed there is no grade on the whole road to Mobile having a rise of more than 39 6-10 feet to the mile, and there is no grade of any considerable length over 35 feet to the mile. The road passes over five other summits of marked character only, each with a short up grade to overcome it, in coming to Mobile, namely: A point at Cazye's Bend, on the Cahaba river, 198 miles from Mobile, 334 feet above low tide water, the length of the rising grade to reach this elevation being only 1½ miles. The next is at Pratt's Bend, also on the Cahaba river, 189 miles from Mobile, 332 feet above tide water; the rising grade to reach this summit being 2½ miles in length. The point near Marion occurs next, 156 miles from Mobile, 332 feet above tide water, the length of rising grade to reach this height being 6 miles. The next summit point occurs at Uniontown, 137 miles from Mobile, the elevation being 274 feet above tide water, and the rising grade to overcome that summit being 1¾ miles in length with 20 feet to the mile grade. And the last being near Choctaw Corner, 94 miles from Mobile, with 352 feet elevation above tide water, and a rising grade on the north side of 4½ miles in length. From Marion to Mobile there is no grade of rise of over 29 feet to the mile.

To those who understand the subject, it will be manifest that a route from a mineral region, presumed of course to be in a mountainous country, with such grades, presents very great facilities for transportation. Better cannot be obtained and could not be expected. No other railroad route could compete with this for the shipment of the iron and coal of Alabama.

It is not every locality which has these many concurring advantages. The ore of the Pilot Knob, in Missouri, is a solid rock, excessively hard. It requires to be drilled and blasted, and then knocked to pieces with sledge hammers. There is no coal there. The ore of the Iron Mountain is for that reason carried to St. Louis by rail, a distance of over eighty miles, and coal is brought there to melt it. The ore costs at St. Louis over five dollars per ton, and yet St. Louis bases its greatness in a great measure on account of this supply of iron for its furnaces. In Michigan the ore is abundant and of easy access; it outcrops on a ridge, from whence it is carried by rail to Green Bay and to Lake Superior, and a large number of vessels are engaged in the transportation of it while the ice does not prevent it. At Pittsburg, it sells, as we are informed, at fifteen dollars per ton. A small quantity is smelted in Michigan, where it is mined, with charcoal, but this is more expensive than with coal, and it is carried so long a distance because it is found cheaper to carry the ore to the coal, than the coal to the ore.

Thus it is that the Alabama iron mines have such immense advantage over other localities, besides producing metal of a far superior quality to that of the other localities.

These are the reasons which have drawn from Colonel Tait the remarks which we find in his report, "That a railroad [of which he speaks] passes through one of the richest iron ore deposits on the continent, or probably in the world." Again, speaking of the iron and coal in such fortunate proximity at the Red Mountain, he says, "that section must soon become what nature has evidently designed it to be, the seat of the iron industry of the South. The further assertion is made by this distinguished and practical geologist, that he regards "Alabama one of the richest States in the Union to-day; not because she has gold, or silver, or diamond deposits, however valuable these may be, but because she has in untold plenty that without which no nation can be great, viz: the twin powers of coal and iron. We have no numbers to compute, we have no capacity to grasp, the unlimited wealth and power that is slumbering in our midst, and that only requires, in a moderate degree, energy, capital and skill to develop." And we again find Col. Tait in a letter written in 1870, to the Superintendent of the South and North Alabama Railroad, then not yet constructed, advancing the same opinion, that "Alabama has the two greatest elements that rule the world, within her grasp, and that it only requires a little of the energy and capital exerted in other directions in the State, to make its mineral region a busy hive of industry, at once the wonder and the envy of the surrounding States."

We will now refer to what is and may be the practical result of these combined advantages, inquire into the cost of these products, and compare this with the cost at other localities.

By the computations of Col. Tait, we have the following data:

That in Great Britain and Belgium, where labor is cheap, the average cost for the manufacturing of pig iron from the ore is $12 per ton, and of wrought iron $36 to $40 per ton, according to quality.

That in Pennsylvania the expense of manufacture of pig iron from the ore, with anthracite coal, is $25 per ton, and railroad iron $65 to $70 per ton.

At the Shelby Iron Works, where the manufacture of charcoal iron is carried on, the ore being brown hematite, dug from a rising ground near the furnace, the items of expense were furnished as follows:

Mining ore for one ton of cast iron	$2 50
Preliminary roasting	50
106¾ bushels of charcoal, at 8 cents	8 56
Limestone for fluxing	25
Smelting and attendant expenses	5 20
General expense of works	3 00
Total	$20 01

If the above statement of expense is compared with an estimate for the smelting of the red hematite by the semi-bituminous coal of the Warrior coal fields, which is singularly free from sulphur, and as well suited for the smelting of iron as the anthracite of Pennsylvania, or the bituminous coal of England and Scotland, the estimate would be as follows:

Cost of ore for one ton of iron	$ 2
Cost of two tons of coal for smelting	2
No preliminary roasting required.	
No fluxing material required.	
Cost of *smelting*, etc.	5
General expense at works	3
Total cost of one ton of iron	$12

This ore requires no roasting, nor *flux*, and the coal does not require to be converted into coke. Prof. Tait considers that the cost of the item for *smelting* in the above estimate could be reduced one-fourth when carried on on a large scale.

The estimate is also given us for making railroad iron in Alabama :

Cost of cast iron and old rail or other equivalent, in proportion of 75 to 25 per cent.	$22
Puddling in reverberatory furnace	5
Reheating, etc.	4
Rolling, etc.	6
General expense of works	3
Total	$40

The average cost in Pennsylvania, we have seen, is $68 per ton, in Europe $38 and in Alabama $40. The price paid for the mine and ore in other countries is very different from what it is here, where it is nominal only. It is for these reasons, says the Professor, that some of the most eminent iron manufacturers of Pennsylvania are making extensive purchases of iron and coal lands in Alabama ; that they are well conversant with these facts and figures, and know that Alabama is destined to become, from her unrivalled natural advantages, the great center of the iron manufacture of the United States. Alabama can indeed fear no competition on the American continent for these productions.

We will now say a word of ourselves. Mobile will necessarily be the point of shipment for these great productions, as being the nearest seaport. The Grand Trunk Railroad for the present, and, possibly, slack water navigation hereafter, will secure this. This railroad is the direct valley route from the mines. It is true that we now have access to the mineral region by two other routes, one by Montgomery and the other by Meridian, by both of which coal is now being shipped to some extent, but they are not sufficiently direct to fully answer our purposes. At the same time we do not underrate the importance of having rival routes, as it will ensure reasonable rates of transportation.

The Grand Trunk Road will be the direct one, and for such heavy articles the price of transportation must be brought to the lowest possible rate. For this, the grade of the route is everything, and Pensacola can never compete with Mobile on this point. The grades required by the route to go there, will give Mobile the supremacy by reason of cheapness of transportation.

But one remark more in conclusion. Mobile is the natural location for the manufactured articles to be made of iron, which this supply of coal and iron will make profitable and necessary. These manufactures must be located in a populous city, and Mobile will become that populous city. The road to fortune is here now presented for the men who have energy and enterprise to engage in the business of iron and coal, and millions will be amassed here, as they have been elsewhere, by those who will devote themselves to it with zeal and perseverance. Such is the belief of your committee. What we now desire is that the facts be made known to the world, and when this is the case, capital, skill and population will very soon be found to accomplish our wishes.

GEORGE N. STEWART,
Chairman of Committee.

The *Cimmaron News*, of April 20, says :—We wish to call the attention of every one in any degree connected with mining mechanics to the excellent "Engineering and Mining Journal" of New York. We are afraid this periodical is not so well known in New Mexico as it should be, yet this is the very place where it should most generally be read. In point of fact such a work is indispensable to those who would follow mining intelligently and successfully. Every fresh application is described at length in its pages ; it is the organ of communication to the mining and engineering world ; while its criticisms on things, and schemes, too, appear to be most honest and fearless. We are quite persuaded that no miner would regret his four dollars for his yearly subscription, and believe, too, that if one group of men studied such a work as this, while another, in exactly similar position, neglected it, that the work of the former would show the more gratifying result at the year's end.

The Copper Mines of Chili.

BY JAMES DOUGLAS, QUEBEC.*

CONTINUED FROM PAGE 331.

The Panteon Mine, at about a mile distant, once yielded handsomely ; but the lode was lost long ago during Mr. LAMBERT's residence in Chili, and all his skill and the expenditure of a couple of hundred thousand dollars failed to re-discover it. The Panteon is a huge quarry, from which, from prehistoric times till to-day, carbonated ores have been mined. The ores were, before Mr. LAMBERT came into possession, smelted principally in a neighboring valley. The slag heaps were virtually heaps of regulus, as the smelter of those days utilised only the bath of metallic copper, which resulted from a single fusion of the rich carbonates, and was as ignorant of the mode of treating the rich slag as he was of calcining and smelting sulphuretted ores. To this day not only do the old *desmontes* of the Panteon supply the furnaces of the Compañia (Mr. LAMBERT's Works, near Serena) with carbonates, but the old Spanish slag heaps are still overhauled.

Mr. LAMBERT built the first reverberatory furnace in Chili, and first smelted sulphuretted ores, which previously had been thrown aside as unserviceable. The Farellon Mine also was the first mine worked by stopes.

The dykes which, as before said, form the north walls of the productive portions of the lode, are themselves filled with little veins, which decrease in produce and size as they recede from the lode.

Fourteen leagues north of Serena is the *mineral* of Higuera—several lodes of yellow sulphuret in a clayey gangue, of very intermittent yield. The ores are smelted at the mines and on the coast at the port of Totoralillos.

This is the last extensive *mineral* in the Province of Coquimbo. Soon after crossing the line of the Province of Atacama, and before reaching the river of Huasco, lies the *mineral* of San Juan, consisting like most other *minerales*, of a group of copper lodes and a number of mines which have been worked from time immemorial, but have never taken rank with the great Chili mines. The most important mines are those now worked by Messrs. HARKER and DICKSON, at Lebrar.

If the traveller crosses the valley of Huasco, at Vallenar, he enters the southern extension of the desert of Atacama, known as the plain of Algaroval. A range of hills separates this plain from the sea much as the coast range of Central Chili confines the great valley of San Fernando. In these hills at a distance of about six leagues in a straight line from the coast, has always been known to exist, but has been worked vigorously only within the last fifteen years, the great *mineral* of Carrizal, which sends almost as much ore to market as the hill of Tomaya.

There are, with a general direction of north-east and south-west, six lodes, only one of which however, gives importance to the *mineral*. This is the *Veta Principal*. It forms the very crest of the hill of Carrizal, and then extends across the valley to the southwest, after which its direction is somewhat altered. On the hill it is wide, though broken, and there occur the richest mines. In the valley to the southwest it is narrower and more compact, yet yields well ; but to the northeast, after the highest crest of the hill is passed, the mines are not producing profitably. On this lode there are 16 setts, yielding monthly about 4000 tons of 13 per cent. ore; but most of this comes from six mines, the Mondaca, Remolinos, Portazuela or Bazanillo Alto, Tora, Cantado, and Santa Rita, all adjoining and situated on the crest of the hill or on its slope towards the valley.

To the north are two other lodes—the *Veta del Agua* and the *Veta Malakoff*, on both of which setts have been taken though the lodes are unproductive, and shafts are being sunk by owners of mines on the *Veta Principal* in order to secure that lode in depth ; another instance, in addition to that afforded by the Urmeneta adit at Tomaya, of the detriment the law does to mining by involving the miner in useless expense in order to secure the permanency of his mine. The shafts being sunk to the north of the Mondaca mine should strike the *Veta Principal*—the nearer, the Margerita shaft, at 130 fathoms ; the further, the Sebastopol shaft, at 165 fathoms. Unless these shafts strike good ore, showing that the run of poor ground now existing in the lower levels of the principal mines on the *Veta Principal* is local and partial, the *mineral* will rapidly decline, for none of the other veins show signs of great productiveness.

To the south of the *Veta Principal* and near at hand is a small lode, the *Veta Santa Rosa*, probably only a branch of the *Veta Principal*.

Then, at a considerable distance on the southern slope of the hill, are the *Veta Greusa*, and at its base the *Veta Lachos*. On the former ten setts have been secured, which yield perhaps 100 tons a month of 13 per cent. ore, but only one is covering expenses ; on the latter the same number of mines are being worked, and two only are returning profits.

The *Veta de Verdiones*, furthest to the south, is like the *Veta Malakoff*, large but unproductive.

The deepest workings are in the Portazuela Mine, whose shaft has reached a depth of 270 fathoms on the inclination of the lode, but the most productive mine is the Mondaca. Its shaft attains a depth of 220 fathoms. An aneroid barometer indicated a vertical depth of 1000 feet. The total length of the shafts, winzes, and levels is about 7 miles. There are employed on Company's account fifty *barreteros* (miners); and 150 tributers work on their own account in the abandoned upper workings.

The mine is supplied with good hauling machinery worked by a 15 horse-power engine. In all the mines in this *mineral* great care is taken to condense the steam. So perfectly is this done, that at the Mondaca 5000 gallons monthly replace the loss in making steam, and supply the wants of the establishment.

The mine is admirably worked. The levels are straighter, the shafts loftier, the timbering is better, and the exploratory work is further ahead of the stopes than in any of the Tomaya mines, thanks to the wisdom of the principal owner, DON RAMON OVALLE, and to the skill of the manager, Mr. MCAULIFF. But the same is generally true of all the large mines in this region ; due probably to the fact that they have been systematically worked only since the introduction of European methods of mining.

At surface and for some 60 fathoms below, the lode is narrow ; but here a branch, supposed to be the *Veta Santa Rosa*, falls into it, and it bulges suddenly to tremendous size. So at intervals it alternately contracts and expands : here diminishing a yard in width ; there bulging to six or seven times that size. The largest excavation in the Mondaca mine is 260 feet deep, 180 feet long, 45 feet wide. Twenty-one miners have worked abreast upon a solid face of ore. At about 120 fathoms from surface magnetic pyrites comes to preponderate so largely that for many fathoms the lode is left standing ; but good yellow sulphuret of copper has reappeared in the central chimney of ore, and it is hoped the mine will resume its former richness. No banded structure is observable, the copper pyrites, quartz, magnetic pyrites, common pyrites, and a trace of blende, being mixed irregularly through the lode. A clay selvage occurs on the floor of the lode, and on the hanging wall a mineral resembling compact asbestos.

(TO BE CONTINUED.)

* Republished, with the revision and corrections by the author, from the London *Quarterly Journal of Science*.

Preparation of Suboxide (Red Oxide) of Copper Suitable for Coloring Glass.

The following way of preparing red oxide of copper has been lately recommended by Dr. BOETTGER. Heat together in a porcelain basin 300 grms. of sulphate of copper ; 450 grms. of sal seignette, tartrate of potassa and soda ; 600 grms. of cane sugar ; and

3600 grms. of water. When the solids are dissolved, add 450 grms. of caustic soda, and boil, stirring the liquid occasionally and replacing the water which evaporates. After about one hour's boiling the liquid will have become colorless, and there will be deposited about 80 grms. of the red oxide, which is washed by decantation and next dried at a gentle heat.

MINING SUMMARY.

California.

Alpine *Miner* of May 11.

WORKING TARSHISH ORES.

The failure of the Monitor & North Western Mill in properly working the ores from the Company's mine on this lode, after roasting in a Whelpley & Storer furnace, some months since, and the more recent want of success in treating the same class of ores in the Tarshish mill, after roasting by the White furnace, has given rise to an impression in the minds of many that, however rich and extensive these mines may be, it will be impossible to work them to profit. These doubters forget that fine bullion and 88 to 94 per cent. of all the ore showed by assay was obtained by Mr. Graff several years ago by treating these same ores bythe ordinary Freiberg roasting and that by the system of concentration now being adopted at the Monitor mill ore of low grade can be made at small expense rich enough to justify this class of roasting. The management here have all along entertained no doubt of largely profitable results, even if the reverberatory furnace had to be resorted to, yet they have hoped to increase those profits by a less expensive process of roasting. Mr. R. C. TERRY of Sacramento, one of the directors of the Company, and Mr. L. L. LEWIS, associated in the management at the mine, have been indefatigable in their efforts to find a remedy for the difficulty labored under so far in these two mills, and we have great satisfaction in being able to say to our readers this week that these efforts are likely to be crowned with complete success. A lot of ore from the Monitor mine on the Tarshish lode, assaying only thirteen dollars a ton, was crushed in their mill, and by passing over only fifty feet of blanket sluices—now being extended to two hundred feet—concentrated to an assay value of $101.80. A ton of this was sent to the Manhattan mill at Austin and another ton to the Auburn mill, near Reno, both of which use the Stetefeldt furnace for roasting. Messrs. TERRY and LEWIS were here this week, after having attended personally the roasting and the working of the ton at the Auburn mill, and they report, and the certificate of the Superintendent of the mill, Mr. OSBISTON, shows all that could be desired in the way of results. The ore was chloridized up to 85 per cent., and no trouble found in working it. Mr. O. is certain he could roast the next lot up to over 90 per cent., as he would better understand the ore. The theory of the failure to properly roast in the Whelpley and Storer furnace is that the fire, being fed in at the top of the furnace with the ore, gives too great a heat at the start and too little at the close of the process, thus disarranging the proper chemical changes necessary to chlorination. After the report from the Manhattan mill comes in, active measures will be taken to convert the furnace at the Monitor mill into a suitable one for the proper roasting of these ores, and meantime the mill will soon be at work crushing and boiling down the products of the mine.

YUBA COUNTY.

Brown's valley Mines.—Marysville *Appeal*, April 27: The Brown's valley quartz mines, including the Pennsylvania, Donnebrook, and other veins or lodes, have been purchased by S. F. capitalists who propose to proceed immediately to re-open and work them vigorously.

Sucker Flat.—G. V. *Union*, April 24: At the Blue Point, the tunnel through which their flume runs is 2,100 ft long. In that hole over $200,000 have been taken out. Their tunnel is 40 ft below the bed-rock.

At the Blue Gravel, work is being prosecuted with vigor. The miners started to run an incline Monday to tap their tunnel. They clean up, on an average, from $60,000 to $70,000 in a run of 40 days. They have started a tunnel which is to be 3,000 ft long to wash the blue gravel that lies between the cement and bed rock.

The Enterprise has not began to wash yet as their tunnel is not through. They have about 520 ft yet to run before it is completed.

The Smartsville claim have run into the hill so far that they now have a 175 ft bank. They have a 250 ft pressure to wash their dirt.

Idaho.

From the Owyhee *Avalache* of April 27.

EMPIRE.

This mine looks well at every point, and will bear the inspection of any practical man. The new shaft is already down 25 feet under the adit level. Since starting, the ground has much improved for sinking, and Superintendant MINEAR, foreseeing that it will not take him so long to get his shaft to the first level as was anticipated, has commenced sinking a winze in the cross-course in the bottom of the old stopes, which is about 20 feet south of the new shaft. This winze will be put down to the depth of the intended first level (100 feet below adit) in about 40 days, and then drills will be run—one to meet the shaft-men, and the other south under the old stopes. The first level will be, on an average, 85 feet below any of the workings south, and entirely under new ground north. The stopes continue to look well in every place where worked, and there will be hundreds of feet of good and profitable ore ground laid open, both north and south, as soon as first level drifts can be run. We are very sanguine about our remarks about this mine, feeling confident that they will run far short of the actual result; because the ground adjacent to, and parallell with the vein is all that can be desired for the production of mineral. From the stopes south of cross-course, during the past week, some of the finest ore ever found in the mine has been broken, and the probability is that there is a very productive run of ore ground all through to the adit level.

WAR EAGLE.

This mine steadily advances in value, and, although the fluctuation of the market may from day to day change its stock quotations, the real value of the mine increases, and whilst there is being opened out so much ore ground, both north and south of the shaft, by running 4th level drifts, we feel assured that there is no mine on the mountain could go much ahead of War Eagle, were there only suitable hoisting works whereby a force of men could be put on in the stopes. Large bodies of splendid ore have been discovered, which will pay big profits for working, as we are confident that Superintendant JOHNSON will prove as soon as he shall have proper facilities for sending it out. The Secretary writes that hoisting machinery for this mine is now on the way.

MAHOGANY.

This is a mine of great promise. The recent rich discovery in the 5th level proves to be a matter of great importance as far as the future propects of the stockholders are concerned. The ledge far surpasses the most sanguine expectations, and the rock is richer than was ever before taken from the mine. Stock has slightly advanced in price, but then the mining share market is always in a continual state of change, and mines often seem "Phœnix like to get fresh life from their own ashes," of which the Mahogany is an instance. Six months ago stock sold at $4, and is to-day quoted at $22; yet taking into consideration the developments made, the many improvements, and the amount of ore sent daily to the mill, we feel no hesitation in saying that this stock is about the safest and best investment in the market even at double the figures last above quoted. The ground is easy for mining which will admit of a very rapid system of development. In the 5th level the ledge varies from 18 inches to 2 feet in width, and will pay fully as well as heretofore reported. In the bottom of the 4th level winze, the vein is about the last named width, and at 28 feet deep the ore is as good as can be found in any mine. There are no improvements to note in the 4th level drift south. The stopes in the back of this level hold their own, sending out their regular quantity of $50 to $60 ore. In the 5th level the ledge is already opened 80 odd feet.

SOUTH CHARIOT.

The men are progressing very favorably in stripping down the shaft from the 2d to the 4th level, and, from present appearances, will henceforth make better headway than for some time past, Superintendent MINEAR having let them a contract to cut down, timber, and secure the shaft from 20 feet above the 3d level to the 4th level. Sinking below the 4th level is necessarily slow, on account of the great abundance of surface water, still, the shaft is making good progress taking this drawback into consideration. A large tank has been put in at the 4th level which will now take up the water.

MINNESOTA.

The shaft in this mine has been let on a contract to sink 100 feet on the 3d level on the course of the vein. The 3d level drifts are run both north and south a distance of 8 feet, showing the ledge to be two feet wide, with good ore, but intermixed with granite. The 2d level drift south is not very good. A winze has been started 80 feet south in the 2d to connect in the 3d level. There the ledge is about 20 inches wide of fair milling ore. The stopes in the back of this level, both north and south look well and the ore shipment has slightly increased. Situated on the rich mineral belt extending from the Oro Fino to the Mahogany, the Minnesota must soon rank as one of the richest in our camp.

SOUTH ORO FINO.

No change to note this week, the working being confined to the two upper levels, it being generally conceded that the 7th level of the Ellmore will run directly under the shutes of the ore that have been found in the upper levels of this mine.

ELLMORE.

This mine is turning out in the most splendid mann The fine discovery of ore in the winze at the bottom of the 7th level has placed it in an enviable position before the public. The ledge has considerably improved and opened out during the past week, showing a solid mass of ore three feet thick, which will pay well for mining and milling and leave handsome returns for profit. More value is attached to this discovery in consequence of its being found under what is termed the slide, and, among the practical miners of this locality, there is a unanimous opinion that the ledge just discovered cannot fail to yield highly remunerative results, auguring a bright future for the stockholders. The mine throughout looks about the same as reported in our last. The shaft is down below the 7th level 25 feet, with good sinking ground.

NORTH ORO FINO.

The ledge in the drift continues about the same as last reported, three feet wide, and having at present an appearance of opening out a good run of ore ground The ledge is fine in the winze, raising All other points are much the same as last noticed.

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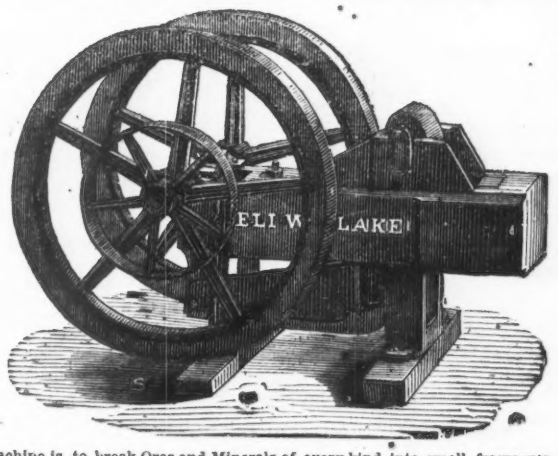

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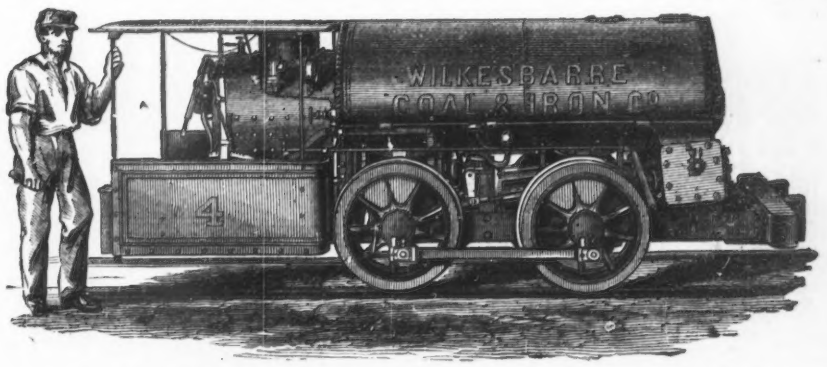

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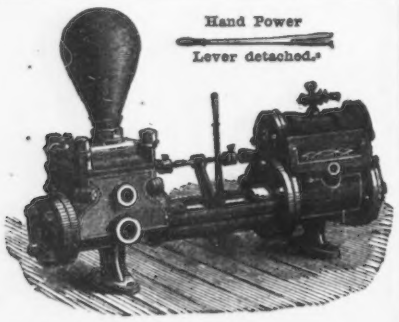

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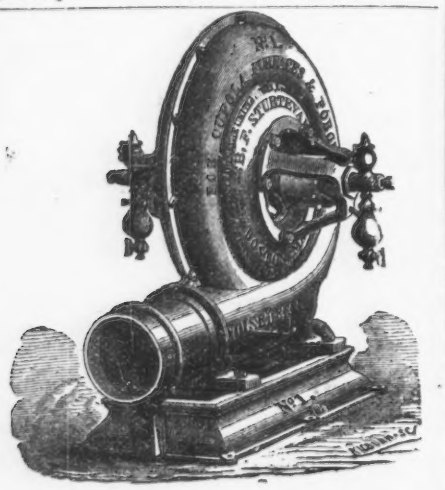

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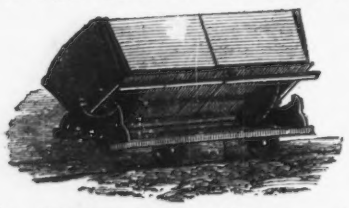

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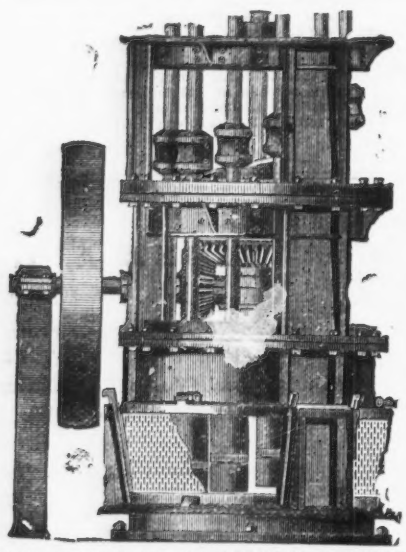

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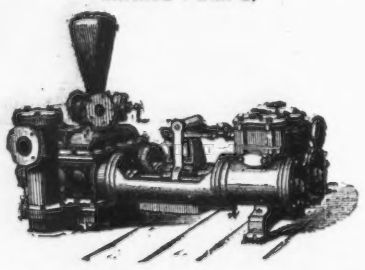

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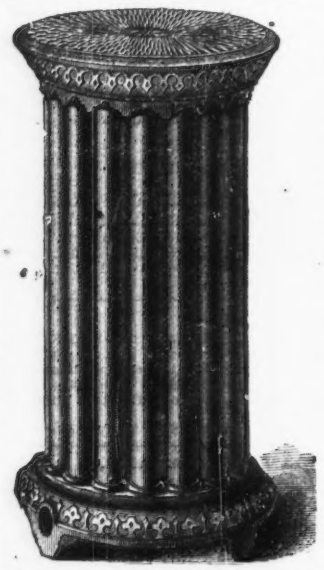

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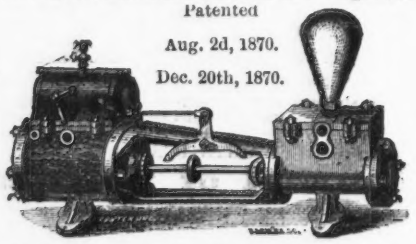

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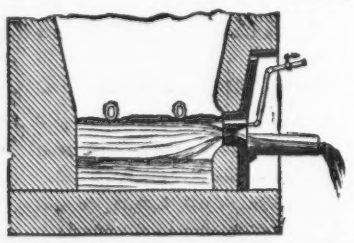

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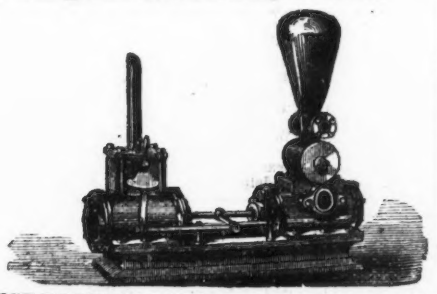

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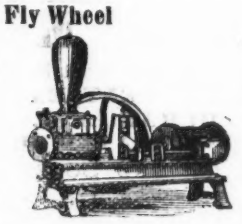

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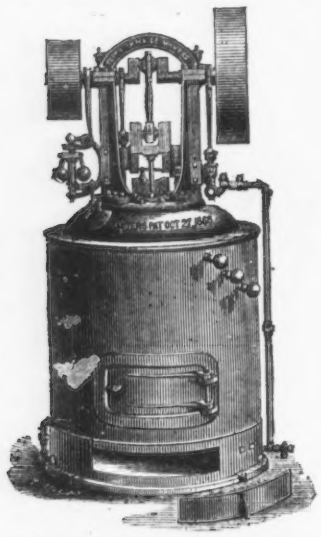

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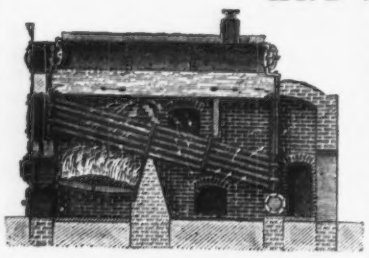

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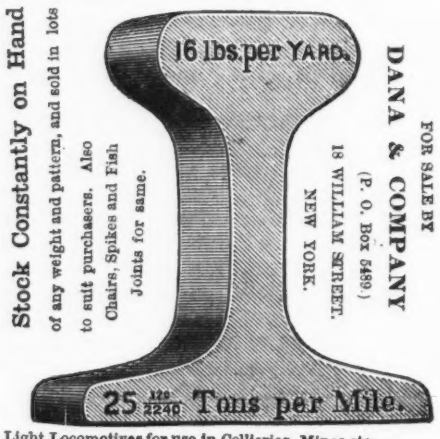

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